



AMSCO

CASTLE EQUIPMENT PARTS AND TECHNICAL MANUAL

SERVICEENGINEERING

764328-255 01-21-97 REV 1

TABLE OF CONTENTS

Section 1 . . Preventive Maintenance

- . . Preventive Maintenance Guide 3522 ▪ 3622 Gravity
- . . Preventive Maintenance Guide 3633 ▪ 3633 Prevac

Section 2 . . . Piping Schematics

- .. 3233 Prevac (medium)
- .. 3325 Instrument Washer (small)
- .. 3333 Prevac (small)
- .. 3422 Gravity (medium)
- .. 3433 Prevac (medium)
- .. **3522** Gravity (small)
- .. **3523 Gravity/Iso** (small)
- .. 3525 Instrument Washer (small)
- .. 3533 Prevac (small)
- .. 3622 Gravity (medium)
- .. 3633 Prevac (medium)

Section 3 . . . Cycle Theory

- .. **3522** Small Gravity
 - . Liquids Cycle
 - . Unwrapped Cycle
 - . Wrapped Cycle
 - . Multitherm Cycle
- .. 353313633 Prevac
 - . Liquids Cycle
 - . Unwrapped Cycle
 - . Wrapped Cycle
 - . Leak Test

Section 4 . . . Error Codes

Section 5 . . . Calibration

- .. **MC2** Sensor Calibration

Section 6 . . . Electrical Schematics

- .. MC2 Control
 - . Control Block Diagram
 - . Relay Configuration
 - 3522 Single Door
 - 3522 Double Door
 - 3525 Double Door
 - 3533 Single Door
 - 3533 Double Door
 - 3622 Single Door
 - 3622 Double Door
 - 3633 Single Door
 - 3633 Double Door
 - . Jumper Configuration MC2 Control & Display
 - 3522
 - 3523
 - 3533
 - 3571
 - 3622
 - 362313633
 - 3671

Section 7 . . . TroubleshootProcedures

- .. Foxboro Transducer
- .. RTD Temperature Probe
- .. AC Output Circuit
- .. AC Input Circuit
- .. Power Supply Board

Section 8 , . . General Parts List

SECTION 1 . . . PREVENTIVE MAINTENANCE

- . , Preventive Maintenance Guide 3522 • 3622 Gravity**
- . . Preventive Maintenance Guide 3533 • 3633 Prevac**

Castle Model 3522/3523/3533 (Small Grav/Iso/Prevac) Sterilizer

Preventive Maintenance Check List

Serial No. _____	Inspection Period:	1	2	3	4	5	6
	Date of Inspection:						
Control ID No. _____	P/M Performed by:						
	Cycle Count:*						

P.M. Type: ☐ **Amplan** ☐ **Amplan Plus** ☐ **Parts & Labor** ☐ **Standard PMA** ☐ **Overtime**

P.M. Freq: ☐ **Monthly** ☐ **Bi-Monthly** ☐ **Quarterly** ☐ **Other** _____

Note: For units equipped with integral generators, use PMCL 764327-014 in addition to this PMCL

	Min. Freq.	Notes/History	1	2	3	4	5	6
1.0 PREPARATION FOR PREVENTIVE MAINTENANCE								
1.1 Discuss equipment with operators & check charts/print-outs	Each							
1.2 Follow appropriate safety procedures; Prepare unit for PM	Each							
1.3 Check utilities supply pressure								
Steam'	Each							
Water'	Each							
2.0 DOOR ASSEMBLY (EACH DOOR ON A DOUBLE DOOR UNIT)								
2.1 Check door for loose hardware	Each							
2.2 Check door for binding of the shafts	Each							
2.3 Verify door alignment	Each							
2.4 Check condition of the door gasket for wear and tear replace if necessary	Each							
2.5 Replace door gasket	1X/yr							
2.6 Check operation of the door	Each							
2.7 Clean dust and dirt from all door mechanisms	Each							
2.8 Lubricate door with high temperature oil	Each							
2.9 Heat the doors and wipe any excess oil off	Each							
2.10 Power doors - Check locking bars for cracks	Each							
3.0 VALVES								
3.1 Replace/rebuild check valves	1X/yr							
3.2 Rebuild steam to chamber valve S1	1X/yr							
3.3 Rebuild fast exhaust valve S2	1X/yr							
3.4 Rebuild filter air valve S3 (3523/3533 only)	1X/yr							

Key:

A = Adjusted

N = New (Replaced)

T = Tested

N/A = Not Applicable

C = Cleaned

R = Rebuilt/Repaired

X = Checked

* = Numerical Input Required

L = Lubricated

S = Setpoint Verified/Calibrated

Castle Model 3522/3523/3533 (Small Grav/Lab/Prevac) Sterilizer

Preventive Maintenance Check List

Ser. No. _____	Inspection Period: 1 2 3 4 6 6										
Cont ID No. _____	Date of Inspection:										

	Min. Freq.	Notes/History	1	2	3	4	5	6
3.5 Rebuild multitherm bypass valve S4 (3523 only)	1X/yr							
3.6 Rebuild slow exhaust valve S5	1X/yr							
3.7 Rebuild ejector water valve S6	1X/yr							
3.6 Rebuild multitherm steam valve S7 (3523 only)	1X/yr							
3.9 Rebuild steam to jacket valve S8	1X/yr							
3.10 Rebuild door seal valve S10	1X/yr							
3.11 Rebuild door seal valve S11 (unidirect only)	1X/yr							
3.12 Check operation and setting of the chamber bleed valve	1X/yr							
3.13 Verify that safety valve is not leaking	Each							
3.14 Replace safety valve	1X/yr							
4.0 MISC PIPING COMPONENTS								
4.1 Inspect steam strainer for debris, clean as needed	2X/yr							
4.2 Inspect water strainer for debris, clean as needed	2X/yr							
4.3 Inspect jacket strainer for debris, clean as needed	2X/yr							
4.4 Inspect chamber drain strainer for debris, clean as needed	2X/yr							
4.5 Replace air filter cartridge	1X/yr							
4.6 Chamber and jacket gauge (s) - Verify proper operation. Replace if needed	Each							
4.7 Rebuild chamber trap	1X/yr							
4.8 Rebuild jacket trap	1X/yr							
4.9 Rebuild back flow preventer or vacuum breaker	1X/yr							
4.10 Verify that there are no leaks	Each							

5.0 CONTROL

Units with Indicator Recorder Controller								
5.1 Verify proper operation of chart drive	Each		1	2	3	4	5	6
5.2 Verify temperature switches are properly adjusted	Each							
5.3 Verify that inking system is working properly	Each							

Key:

A = Adjusted

N = New (Replaced)

T = Tested

N/A = Not Applicable

C = Cleaned

R = Rebuilt/Repaired

X = Checked

* = Numerical Input Required

L = Lubricated

S = Setpoint Verified/Calibrated

Castle Model 3522/3523/3533 (Small Grav/Lab/Prevac) Sterilizer

Preventive Maintenance Check List

Ser. No. _____	Inspection Period:	1	2	3	4	5	6		
Cont ID No. _____	Date of Inspection:								
	Min. Freq.	Notes/History		1	2	3	4	5	6
Units with Message Center									
5.4	Verify that the printer is operating properly. Check the printout for darkness and legible print. Replace the ink cartridge if necessary	Each							
5.5	Check that all indicator lights and the segmented digits light (press to test)	Each							
5.6	Adjust the brightness of the Message Centers display	A/R							
5.7	Verify that the date and time are correct. If not, correct	Each							
5.8	Verify temperature and pressure display agrees with the printout and calibrated test instruments	Each							
5.9	Recalibrate temperature and pressure	1X/yr							
6.0 FINAL CHECKOUT AND TEST									
6.1	Clean dirt and lint from components. Check all wiring, terminals and socket connections for damage or fraying	Each							
6.2	Check for steam leaks at pressure transducer/pressure switches inside the control housing	Each							
6.3	Check all plugs for secure connections	Each							
6.4	Run machine through each cycle to verify proper operation. Watch display for and check printout for correct cycle parameters	Each							
6.5	Make sure all error codes are cleared and corrected	Each							
6.6	Reinstall any panel or cover removed. Check area to insure removal of all materials used during inspection	Each							
6.7	Notify customer that PM inspection is complete	Each							

Key:

A = Adjusted

N = New (Replaced)

T = Tested

N/A = Not Applicable

C = Cleaned

R = Rebuilt/Repaired

X = Checked

* = Numerical Input Required

L = Lubricated

S = Setpoint Verified/Calibrated

Castle Model 3622/3633 (Medium Gravity/Prevac) Sterilizer

Preventive Maintenance Check List

Serial No.	Inspection Period:	1	2	3	4	5	6
	Date of Inspection:						
Control ID No.	P/M Performed by:						
	Cycle Count:						
P.M. Type: <input type="checkbox"/> Amplan <input type="checkbox"/> Amplan Plus <input type="checkbox"/> Parts & Labor <input type="checkbox"/> Standard PMA <input type="checkbox"/> Overtime							
P.M. Freq: <input type="checkbox"/> Monthly <input type="checkbox"/> Bi-Monthly <input type="checkbox"/> Quarterly <input type="checkbox"/> Other _____							
	Min. Freq.	Notes/History		1	2	3	4
		5	6				
1.0 PREPARATION FOR PREVENTIVE MAINTENANCE							
1.1	Discuss equipment with operators & check charts/print-outs	Each					
1.2	Follow appropriate safety procedures; Prepare unit for PM	Each					
1.3	Check utilities supply pressure						
	Steam	Each		|	|	|	|
	Water*	Each		|	|	|	|
2.0 DOOR ASSEMBLY (EACH DOOR ON A DOUBLE DOOR UNIT)							
2.1	Check door for loose hardware	Each		|	|	|	
2.2	Check door for binding of the shafts	Each		|		|	|
2.3	Verify door alignment	Each			|	|	|
2.4	Check condition of the door gasket for wear and tear replace if necessary	Each			|	|	|
2.5	Replace door gasket	1X/yr		|	|	|	|
2.6	Check operation of the door	Each					
2.7	Clean dust and dirt from all door mechanisms	Each					
2.8	Lubricate door with high temperature oil	Each					
2.9	Heat the doors and wipe any excess oil off	Each					
2.10	Power doors - Check locking bars for cracks	Each					
3.0 VALVES							
3.1	Replace/rebuild check valves	1X/yr					
3.2	Rebuild steam to chamber valve S1	1X/yr					
3.3	Rebuild fast exhaust valve S2	1X/yr					
3.4	Rebuild filter air valve S3	1X/yr					
3.5	Rebuild multitherm bypass valve S4 (Vac only)	1X/yr					

Key:

A = Adjusted

N = New (Replaced)

T = Tested

N/A = Not Applicable

C = Cleaned

R = Rebuilt/Repaired

X = Checked

* = Numerical Input Required

L = Lubricated

S = Setpoint Verified/Calibrated

Castle Model 3622/3633 (Medium Gravity/Prevac) Sterilizer

Preventive Maintenance Check List

Ser. No. _____	inspection Period:						1	2	3	4	5	6
Cont ID No. _____	Date of Inspection:											

	Min. Freq.	Notes/History	1	2	3	4	5	6
3.6 Rebuild slow exhaust valve S5 (Vac only)	1X/yr							
3.7 Rebuild condenser water valve S5	1X/yr							
3.8 Rebuild ejector water valve S6	1X/yr							
3.9 Rebuild multitherm steam valve S7	1X/yr							
3.10 Rebuild steam to jacket valve S8	1X/yr							
3.11 Check operation and setting of the chamber bleed valve	1X/yr							
3.12 Verify that safety valve is not leaking	Each							
3.13 Replace safety valve	1X/yr							
4.0 MISC PIPING COMPONENTS								
4.1 Inspect steam strainer for debris, clean as needed	2X/yr							
4.2 Inspect water strainer for debris, clean as needed	2X/yr							
4.3 Inspect jacket strainer for debris, clean as needed	2X/yr							
4.4 Inspect chamber drain strainer for debris, clean as needed	2X/yr							
4.5 Replace air filter cartridge	1X/yr							
4.6 Chamber and jacket gauge (s) - Verify proper operation. Replace if needed	Each							
4.7 Rebuild chamber trap	1X/yr							
4.8 Rebuild jacket trap	1X/yr							
4.9 Rebuild back flow preventer or vacuum breaker	1X/yr							
4.10 Verify proper operation of heat exchanger (Vac only)	Each							
4.11 Verify that there are no leaks	Each							
15.0 CONTROL								
Units with Indicator Recorder Controller								
5.1 Verify proper operation of chart drive	Each							
5.2 Verify temperature switches are properly adjusted	Each							
5.3 Verify that inking system is working properly	Each							

Key:

A = Adjusted

N = New (Replaced)

T = Tested

N/A = Not Applicable

C = Cleaned

R = Rebuilt/Repaired

X = Checked

* = Numerical Input Required

L = Lubricated

S = Setpoint Verified/Calibrated

Castle Model 3622/3633 (Medium Gravity/Prevac) Sterilizer

Preventive Maintenance Check List

Ser. No. _____	Inspection Period:		1	2	3	4	5	6
Cont ID No. _____	Date of Inspection:							
	Min. Freq.	Notes/History	1	2	3	4	5	6
Units with Message Center								
5.4	Verify that the printer is operating properly. Check the printout for darkness and legible print. Replace the ink cartridge if necessary	Each						
5.5	Check that all indicator lights and the segmented digits light (press to test)	Each						
5.6	Adjust the brightness of the Message Centers display	A/R						
5.7	Verify that the date and time are correct. If not, correct	Each						
5.8	Verify temperature and pressure display agrees with the printout and calibrated test instruments	Each						
5.9	Recalibrate temperature and pressure	1X/yr						
6.0 FINAL CHECKOUT AND TEST								
6.1	Clean dirt and lint from components. Check all wiring, terminals and socket connections for damage or fraying	Each						
6.2	Check for steam leaks at pressure transducer/pressure switches inside the control housing	Each						
6.3	Check all plugs for secure connections	Each						
6.4	Run machine through each cycle to verify proper operation. Watch display for and check printout for correct cycle parameters	Each						
6.5	Make sure all error codes are cleared and corrected	Each						
6.6	Reinstall any panel or cover removed. Check area to insure removal of all materials used during inspection	Each						
6.7	Notify customer that PM inspection is complete	Each						

Key:

A = Adjusted

C = Cleaned

L = Lubricated

N = New (Replaced)

R = Rebuilt/Repaired

S = Setpoint Verified/Calibrated

T = Tested

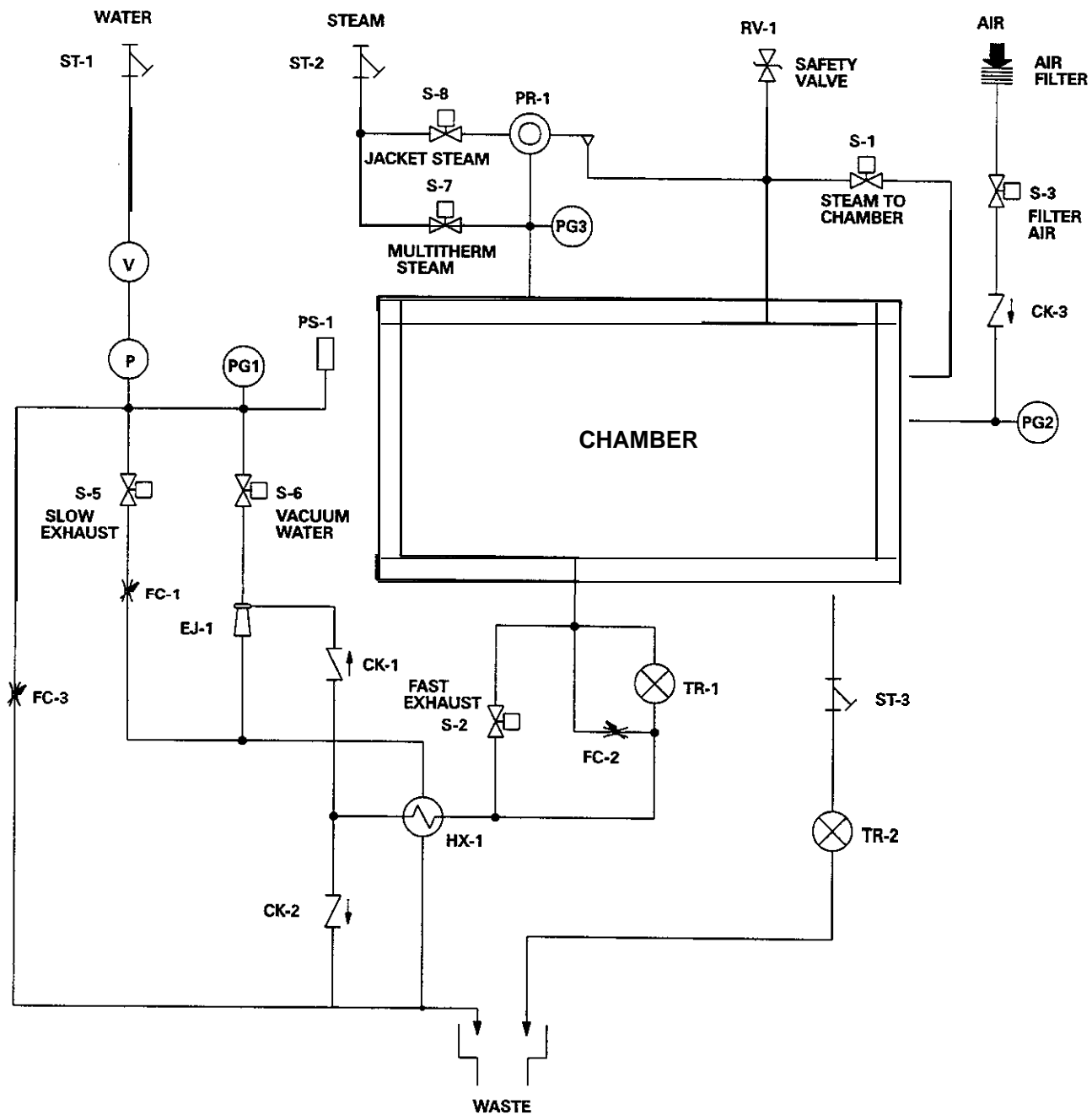
X = Checked

N/A = Not Applicable

* = Numerical Input Required

SECTION 2 . . . PIPING SCHEMATICS

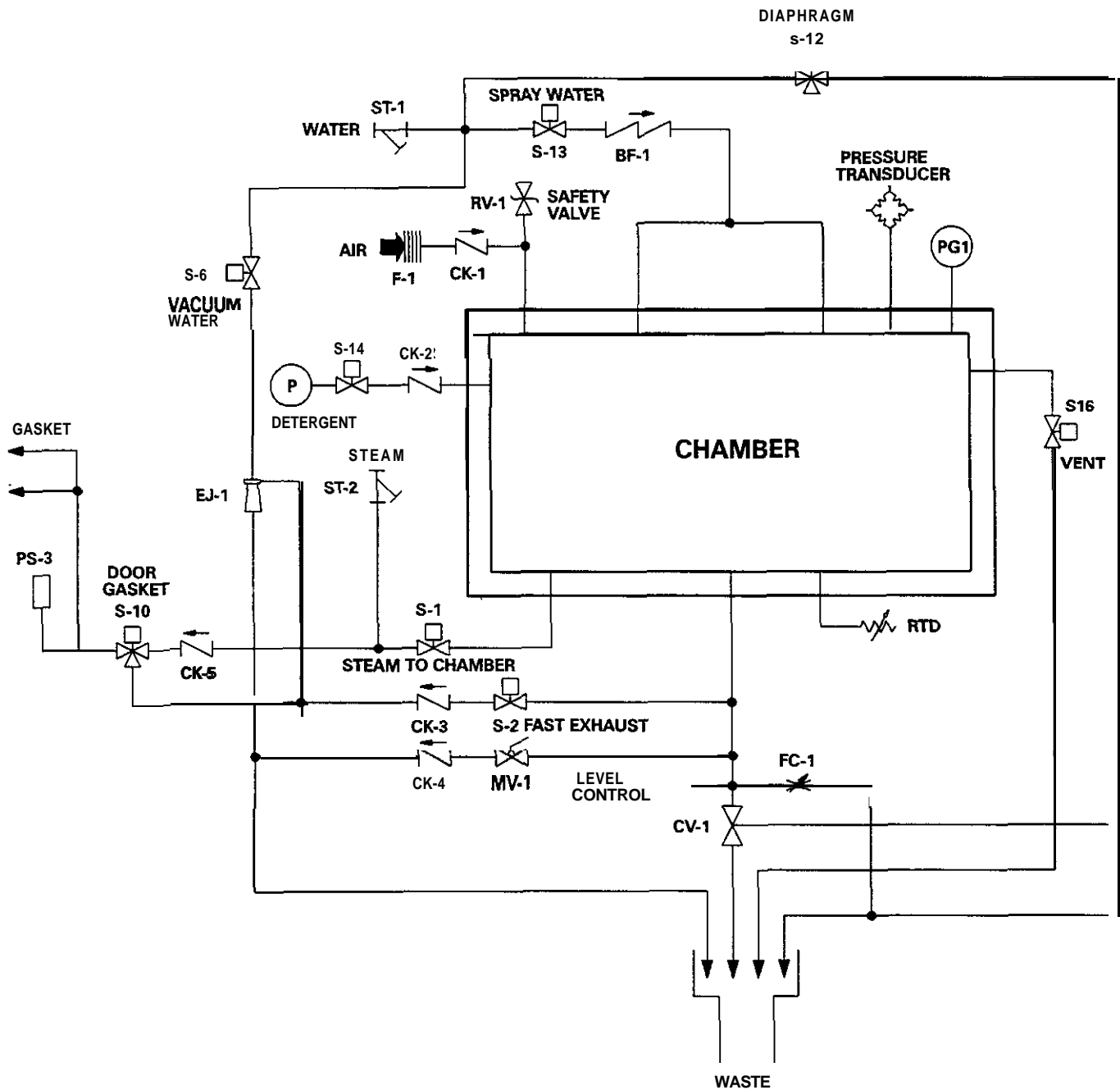
- . , 3233 Prevac (medium)
- .. 3325 Instrument Washer
- .. 3333 Prevac (small)
- .. 3422 Gravity (medium)
- .. 3433 Prevac (medium)
- .. 3522 Gravity (small)
- .. 3523 **Gravity/Iso** (small)
- .. 3525 Instrument Washer
- .. 3533 Prevac (small)
- .. 3622 Gravity (medium)
- .. 3633 Prevac (medium)



**PIPING SCHEMATIC, 3233
762650-403**

CASTLE 3233 PARTS LIST MEDIUM VACAMATIC ELECTROMECHANICAL STERILIZER

REF. NO.	AMSCO PART NO.	DESCRIPTION
CK-1	764328-210	VALVE, CHECK 1"NPT
CK-2	764320-492	VALVE CHECK 1/2"NPT
CK-3	764323-800	VALVE: CHECK 3/4"NPT
EJ-1	764328-246	EJECTOR, 3/4"NPT WATER
F-I	764326269	FILTER, AIR IN
FC-1	764328-270	VALVE, FLOW CONTROL 1/2"NPT
FC-2	764328-241	VALVE, FLOW CONTROL 1/8"NPT
HX-1	764328-232	HEAT EXCHANGER
PG-1	764328-237	GAUGE, PRESSURE 0 TO 100 PSI 1/4"NPT
PG-2	764328-263	GAUGE, PRESSURE -30 TO 60 PSI 1/8"NPT
PG-3	764328-237	GAUGE, PRESSURE 0 TO 100 PSI 1/4"NPT
PR-1	764328-271	PRESSURE REGULATOR
PS-1	764328-287	PRESSURE SWITCH
RV-1	150828.476	VALVE, SAFETY 3/4"NPT X 1 1/4"NPT
S-I	764328-532	VALVE, SOLENOID 3/4"NPT STEAM TO CHAMBER
	764328-534	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
s-2	83229-002	VALVE, SOLENOID 1"NPT FAST EXHAUST
	764071-001	REPAIR KIT, SOLENOID VALVE
	764071-002	COIL, REPLACEMENT
s-3	764328-227	VALVE, SOLENOID 3/4"NPT FILTER AIR
	764328-228	REPAIR KIT, SOLENOID VALVE
	764323.941	COIL, REPLACEMENT
S-S	764328-222	VALVE, SOLENOID 1/2"NPT SLOW EXHAUST
	764316.147	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-6	764328-223	VALVE, SOLENOID 3/4"NPT VACUUM WATER
	764324-366	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-I	764328-536	VALVE, SOLENOID 3/4"NPT MULTITHERM STEAM
	910006343	REPAIR KIT, SOLENOID VALVE
	764323-942	COIL, REPLACEMENT
S-8	764328-536	VALVE, SOLENOID 3/4"NPT JACKET STEAM
	910006-343	REPAIR KIT, SOLENOID VALVE
	764323-942	COIL, REPLACEMENT
ST-1	129362-472	STRAINER, 1"NPT WATER
	764326-664	SCREEN, REPLACEMENT
ST-2	910008-386	STRAINER, 3/4"NPT STEAM
	910009-017	SCREEN, REPLACEMENT
ST-3	910008-166	STRAINER, 1/2"NPT
	910009-009	SCREEN, REPLACEMENT
TR-1	762115-001	TRAP, 1/2"NPT
TR-2	762115-001	TRAP, 1/2"NPT
	764328-345	PM PACK, SOLENOID VALVES
	764328-344	PM PACK, CHECK VALVES AND TRAPS
	764328-260	GASKET, DOOR

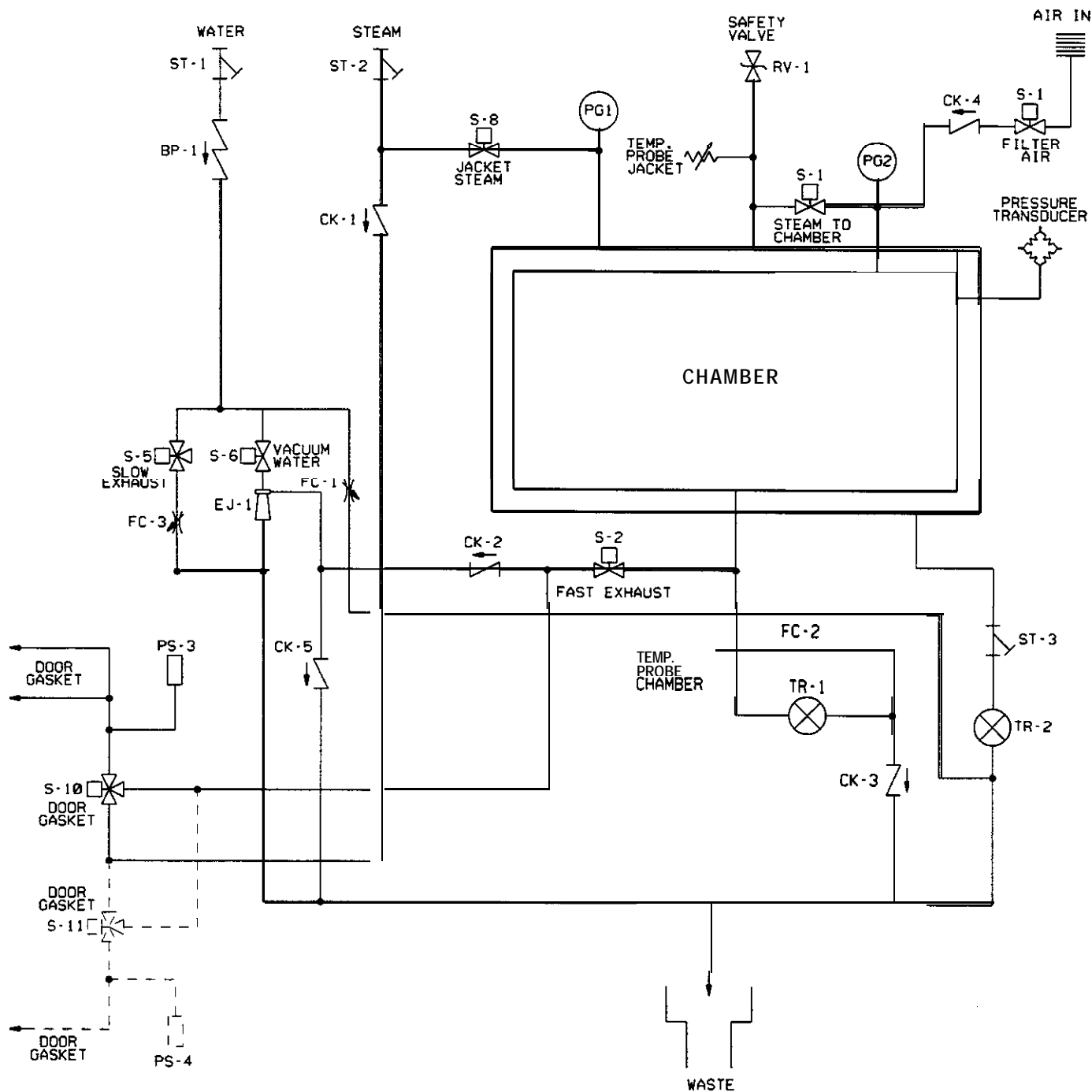


PIPING SCHEMATIC, 3325
762650-402

CASTLE 3325 PARTS LIST

SMALL WASHER STERILIZER

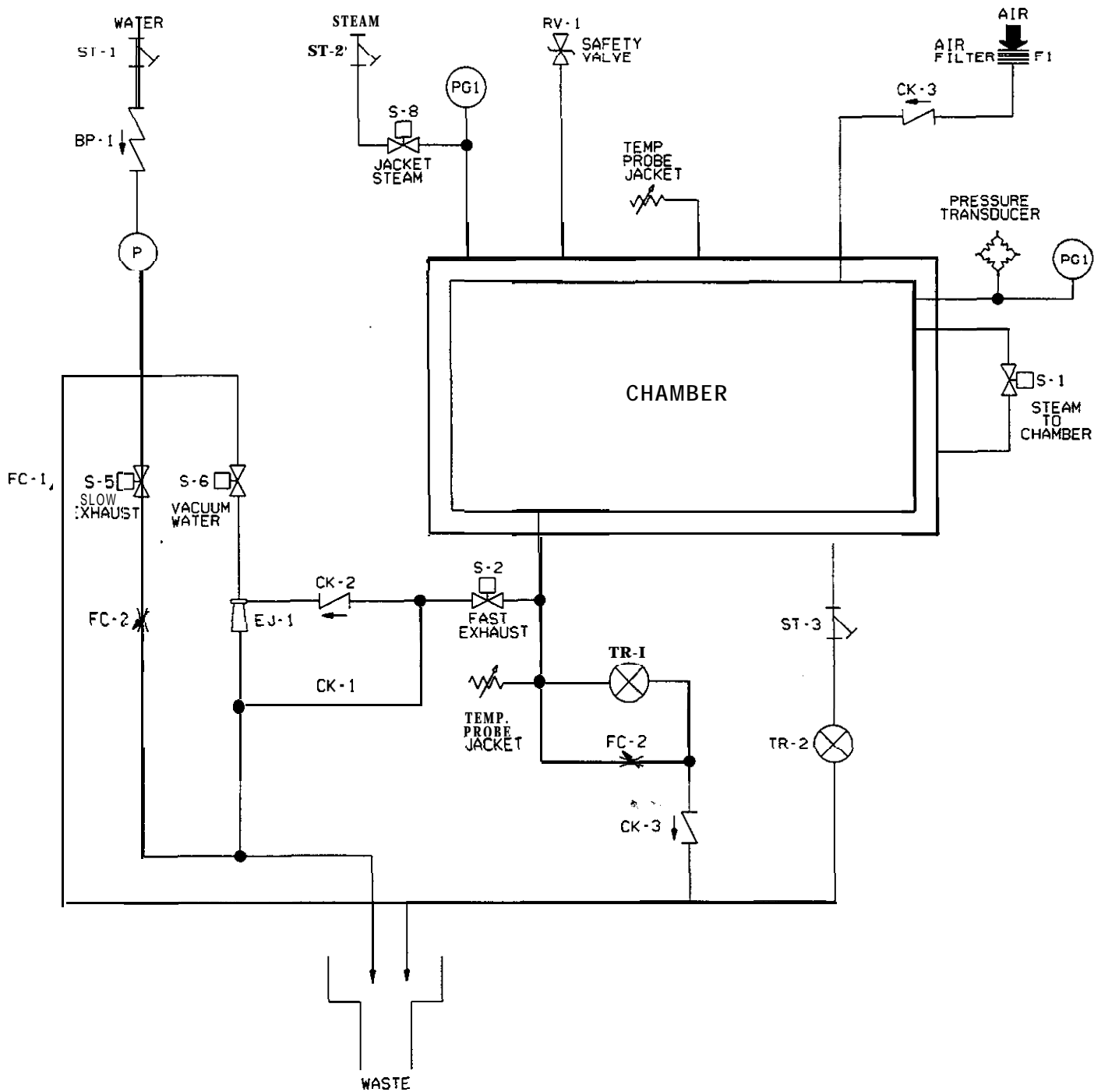
REF. NO.	AMSCO PART NO.	DESCRIPTION
BF-1	764323-800	BACKFLOW PREVENTER, 3/4"NPT
CK-1	101005416	VALVE, CHECK 3/8"NPT
CK-2	764325470	VALVE, CHECK 1/4"NPT
CK-3	764323-800	VALVE, CHECK 3/4"NPT
CK4	784328-249	VALVE, CHECK 1/4"NPT
CK-5	764328-249	VALVE, CHECK 1/4"NPT
cv-1	764328-239	VALVE, DIAPHRAGM 1"NPT
EJ-1	764328.246	EJECTOR, 3/4"NPT WATER
F-I	764328-268	ELEMENT, AIR/STEAM FILTER
FC-1	764328-241	VALVE, FLOW CONTROL 1/8"NPT
MV-1	56401-096	VALVE, BALL 3/4"NPT
P	764328-236	PUMP, DETERGENT
PG-1	764328-263	GAUGE, PRESSURE -30 TO 60PSI (CHAMBER)
PS-3	764328-287	PRESSURE SWITCH
RV-1	56396-708	VALVE, SAFETY 1/2"NPT X 1"NPT 40 PSIG
S-I	764328-533	VALVE, SOLENOID 3/8"NPT STEAM TO CHAMBER
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
s-2	764328-532	VALVE, SOLENOID 3/4"NPT FAST EXHAUST
	764328.534	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
S-8	754328-223	VALVE, SOLENOID 3/4"NPT VACUUM WATER
	764324.356	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
s-10	764328-224	VALVE, SOLENOID 1/4"NPT DOOR GASKET
	764328-225	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
s-12	764328-621	VALVE, SOLENOID 1/4"NPT DIAPHRAGM
	764328-522	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
s-13	764328-223	VALVE, SOLENOID 3/4"NPT SPRAY WATER
	764324-366	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
s-14	764328-250	VALVE, SOLENOID 1N"NPT DETERGENT
	764328-251	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-16	764328-533	VALVE, SOLENOID 3/8"NPT VENT
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
ST-1	910008-386	STRAINER, 3/4"NPT WATER
	910009-017	SCREEN, REPLACEMENT
ST-2	910008-156	STRAINER, 1/2"NPT STEAM
	910009-009	SCREEN, REPLACEMENT
	764328-340	PM PACK, SOLENOID VALVES
	764328-342	PM PACK, CHECK VALVES
	764328-281	GASKET, DOOR (16X 16) CHANNEL
	764328-262	GASKET, DOOR (20 X 20) CHANNEL
	784328-313	GASKET, DOOR (16 X 16) ROUND
	764328-314	GASKET, DOOR (20 X 20) ROUND



**PIPING SCHEMATIC, 3333
762650-433**

CASTLE 3333 PARTS LIST SMALL VACAMATIC STERILIZER

REF. NO.	AMSCO PART NO.	DESCRIPTION
BP-1	764323.800	BACKFLOW PREVENTER. 3/4"NPT
CK-1	764328-249	VALVE, CHECK 1/4"NPT
CK-2	764323-800	VALVE, CHECK 3/4"NPT
CK-3	764320-492	VALVE, CHECK 1/2"NPT
CK-4	764320-492	VALVE, CHECK 1/2"NPT
CK-5	764323-800	VALVE, CHECK 3/4"NPT
EJ-1	764328-246	EJECTOR, 3/4"NPT WATER
FC-2	764328-241	VALVE, FLOW CONTROL 1, 1/8"NPT
PG-1	764328-238	GAUGE, PRESSURE 0 TO 100 PSI 1/8"NPT
PG-2	764328-263	GAUGE, PRESSURE -30 TO 60 PSI 1/8"NPT
PS-3	764328-287	PRESSURE SWITCH
PS-4	764328-287	PRESSURE SWITCH
RV-1	56396-708	VALVE, SAFETY 1/2"NPT X 1"NPT
S-1	764328.633	VALVE, SOLENOID 3/8"NPT STEAM TO CHAMBER
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323-946	COIL, REPLACEMENT
s-2	764328-532	VALVE, SOLENOID 3/4"NPT FAST EXHAUST
	764328-534	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
s-3	764328-533	VALVE, SOLENOID 3/8"NPT FILTER AIR
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
s-5	764328.521	VALVE, SOLENOID 1/4"NPT SLOW EXHAUST
	764328.522	REPAIR KIT, SOLENOID VALVE
	764323.941	COIL, REPLACEMENT
S-6	764328-223	VALVE, SOLENOID 3/4"NPT VACUUM WATER
	764324-356	REPAIR KIT, SOLENOID VALVE
	764323-949	COIL, REPLACEMENT
S-8	764328-533	VALVE, SOLENOID 3/8"NPT JACKET STEAM
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323.940	COIL, REPLACEMENT
s-10	764328-224	VALVE, SOLENOID 1/4"NPT STEAM TO DOOR GASKET
	764328-226	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
S-11	764328-224	VALVE, SOLENOID 1/4"NPT STEAM TO DOOR GASKET
	764328-225	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
ST-1	910008-156	STRAINER, 1/2"NPT WATER
	910009-009	SCREEN, REPLACEMENT
ST-2	910008-156	STRAINER, 1/2"NPT WATER
	910009-009	SCREEN, REPLACEMENT
ST-3	910008-156	STRAINER, 1/2"NPT WATER
	910009-009	SCREEN, REPLACEMENT
TR-1	762115.001	TRAP, STEAM 1/2"NPT
TR-2	782115-001	TRAP, STEAM 1/2"NPT
	764328.523	PM PACK, SOLENOID VALVES
	764328-511	PM PACK, CHECK VALVES AND TRAPS
	764328-261	GASKET, DOOR (16 X 16) CHP CHANNEL
	764328-262	GASKET, DOOR (20 X 20) CHANNEL
	764328-313	GASKET, DOOR (16 X 16) ROUND
	764328-314	GASKET, DOOR (20 X 20) ROUND

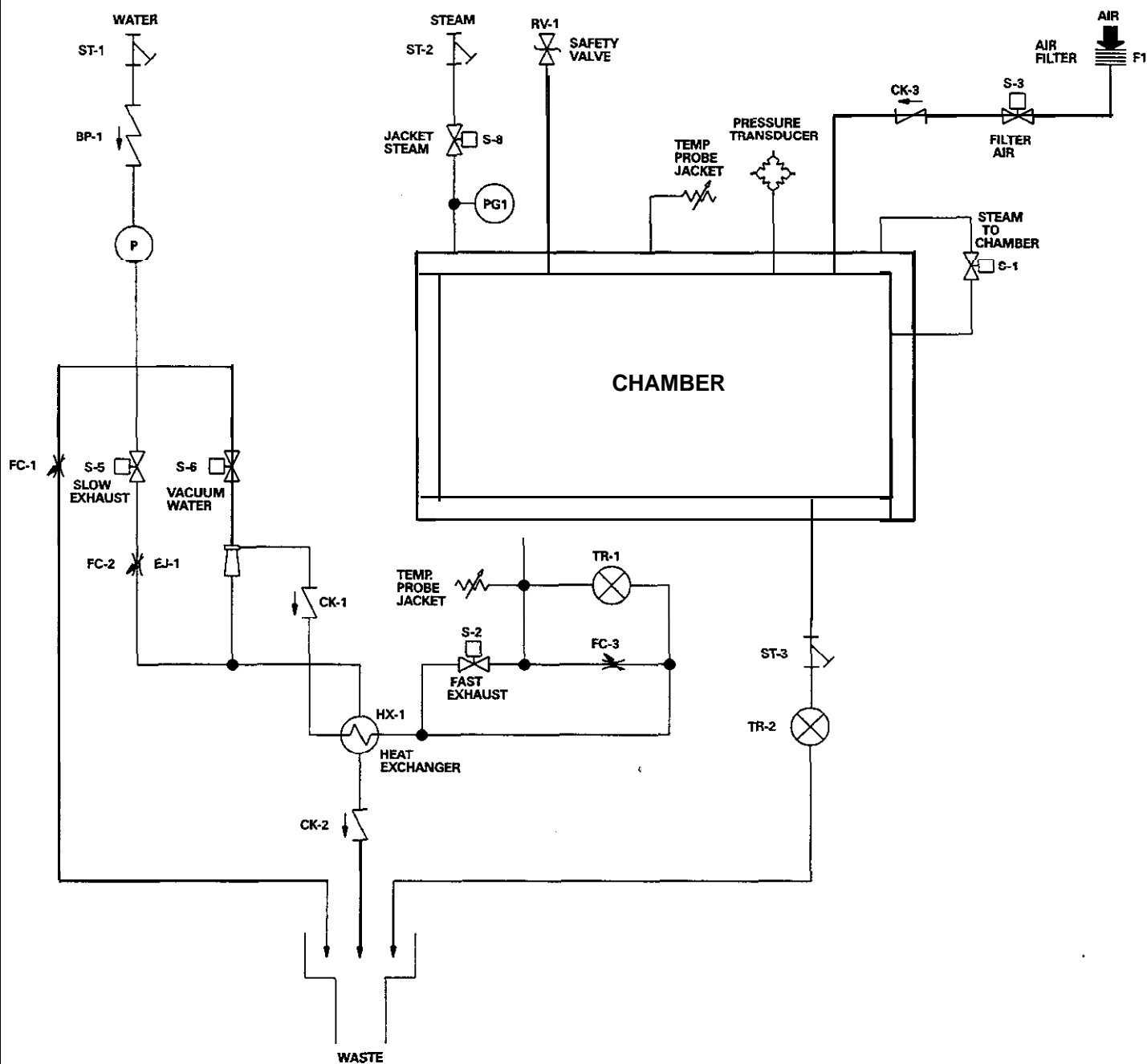


PIPING SCHEMATIC, 3422
762650-434

CASTLE 3422 PARTS LIST

MEDIUM GRAVITY STERILIZER

REF. NO.	AMSCO PART NO.	DESCRIPTION
BP-1	764328-210	BACKFLOW PREVENTER 1"NPT
CK-1	764320-492	VALVE, CHECK 1/2"NPT
CK-2	764328-210	VALVE, CHECK 1"NPT
CK-3	764320-492	VALVE; CHECK 1/2"NPT
CK-4	764323-800	VALVE, CHECK 3/4"NPT
W-1	764328-246	EJECTER, 3/4"NPT WATER
FC-2	764328-241	VALVE, MINI 1/8"NPT
PG-1	764328-238	GAUGE, PRESSURE 0 TO 100 PSI 1/8"NPT
PG-1	764328-263	GAUGE, PRESSURE -30 TO 60 PSI 1/8"NPT
RV-1	150828-476	VALVE, SAFETY 3/4"NPT X 1 1/4"NPT 40PSIG
S-1	764328-532	VALVE, SOLENOID 3/4"NPT STEAM TO CHAMBER
	764328-534	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
s-2	83229-002	VALVE, SOLENOID 1"NPT FAST EXHAUST
	764071-001	REPAIR KIT, SOLENOID VALVE
	764071-002	COIL, REPLACEMENT
s-5	764320-222	VALVE, SOLENOID 1/2"NPT SLOW EXHAUST
	764316-147	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-6	764328-223	VALVE, SOLENOID 3/4"NPT VACUUM WATER
	764324-356	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-8	764328-536	VALVE, SOLENOID 3/4"NPT JACKET STEAM
	910006-343	REPAIR KIT, SOLENOID VALVE
	764323-942	COIL, REPLACEMENT
ST-1	129362-472	STRAINER, 1"NPT
	764326-664	SCREEN, REPLACEMENT
ST-2	910008-386	STRAINER, 3/4"NPT
	910009-017	SCREEN, REPLACEMENT
ST-3	910008-156	STRAINER, 1/2"NPT
	910009-009	SCREEN, REPLACEMENT
TR-1	762115.001	TRAP, STEAM 1/2"NPT
TR-2	762115-001	TRAP, STEAM 1/2"NPT
	764328-524	PM PACK, SOLENOID VALVES
	764328-510	PM PACK, CHECK VALVES AND TRAPS
	764328-260	GASKET, DOOR

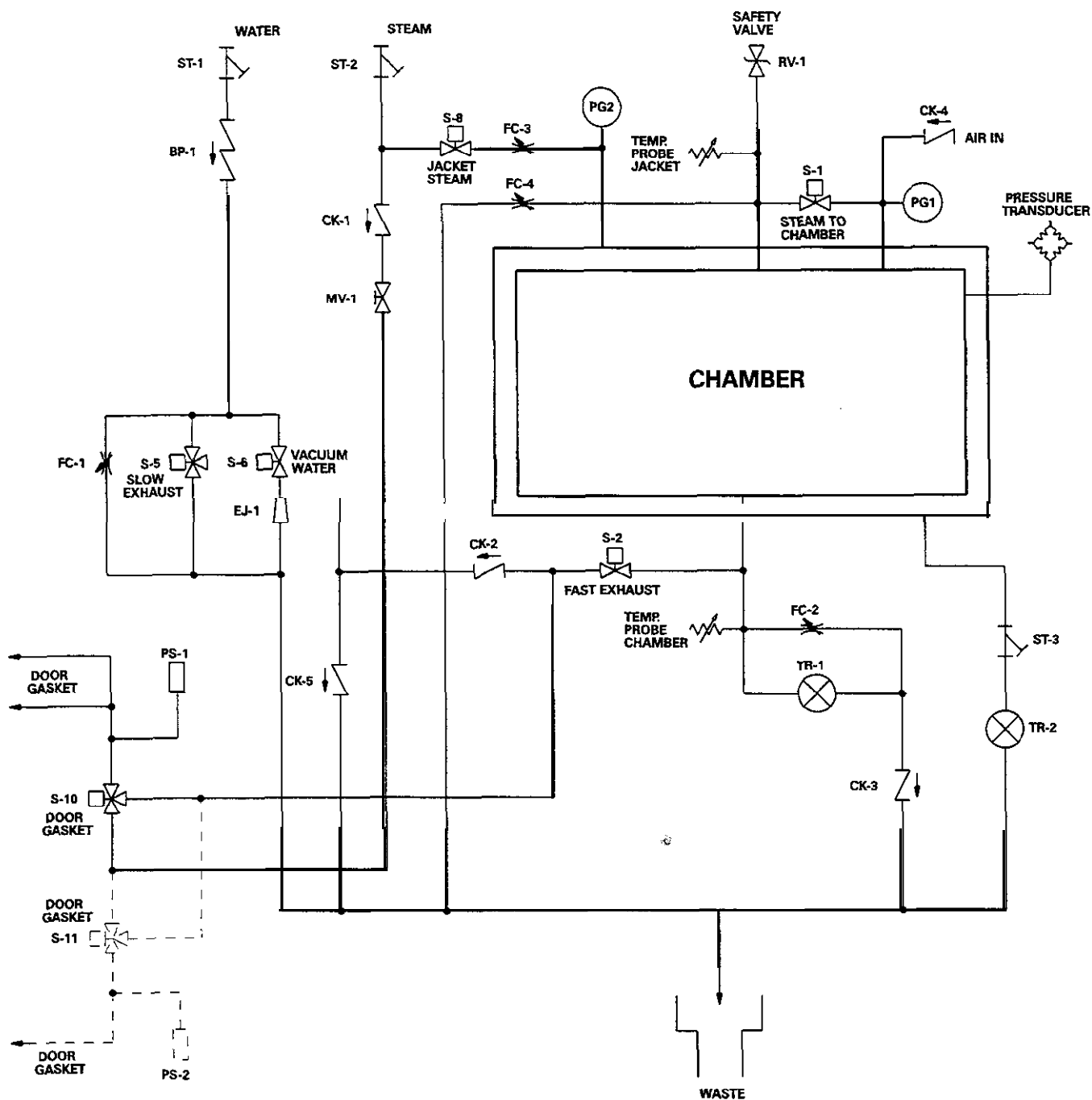


**PIPING SCHEMATIC, 3433 (I
762650-401**

CASTLE 3433 PARTS LIST

MEDIUM VACAMATIC STERILIZER

REF. NO.	AMSCO PART NO.	DESCRIPTION
BP-1	764328-210	BACKFLOW PREVENTER 1"NPT
CK-1	764328-210	VALVE CHECK 1"NPT
CK-2	764320-492	VALVE: CHECK 1/2"NPT
CK-3	764323-800	VALVE, CHECK 3/4"NPT
N - 1	764328-246	EJECTER, 3/4"NPT WATER
F-1	764328-268	FILTER, AIR
FC-1	764328-241	VALVE, FLOW CONTROL 1/8"NPT
FC-2	764328-270	VALVE, FLOW CONTROL 1/2"NPT
FC-3	764328-241	VALVE, FLOW CONTROL 1/8"NPT
HX-1	764328-232	HEAT EXCHANGER
PG-1	764328-238	GAUGE, PRESSURE 0 TO 100 PSI 1/4"NPT (JACKET)
RV-1	150828476	VALVE, SAFETY 3/4"NPT X 1 1/4"NPT 40PSIG
S-1	764328-532	VALVE, SOLENOID 3/4"NPT STEAM TO CHAMBER
	764328-534	REPAIR KIT, SOLENOID VALVE
	764323-841	COIL, REPLACEMENT
s-2	83229-002	VALVE, SOLENOID 1"NPT FAST EXHAUST
	764071-001	REPAIR KIT, SOLENOID VALVE
	764071.002	COIL, REPLACEMENT
s-3	764328.227	VALVE, SOLENOID 3/4"NPT FILTER AIR
	764328-228	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
S-S	764328-222	VALVE, SOLENOID 1/2"NPT SLOW EXHAUST
	764316-147	REPAIR KIT, SOLENOID VALVE
	764323.940	COIL, REPLACEMENT
S-6	764328.223	VALVE, SOLENOID 3/4"NPT VACUUM WATER
	764324-356	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-8	784328-536	VALVE, SOLENOID 3/4"NPT JACKET STEAM
	910006-343	REPAIR KIT, SOLENOID VALVE
	764323-942	COIL, REPLACEMENT
ST-1	129382-472	STRAINER, 1"NPT
	764326-664	SCREEN, REPLACEMENT
ST-2	129362472	STRAINER, 1"NPT
	784326-864	SCREEN, REPLACEMENT
ST-3	910008-386	STRAINER, 1/2"NPT
	910009-017	SCREEN, REPLACEMENT
TR-1	762115-001	TRAP, STEAM 1/2"NPT
TR-2	762115-001	TRAP. STEAM 1/2"NPT
	764328-343	PM PACK, SOLENOID VALVES
	764328-344	PM PACK. CHECK VALVES AND TRAPS
	764328-260	GASKET, DOOR

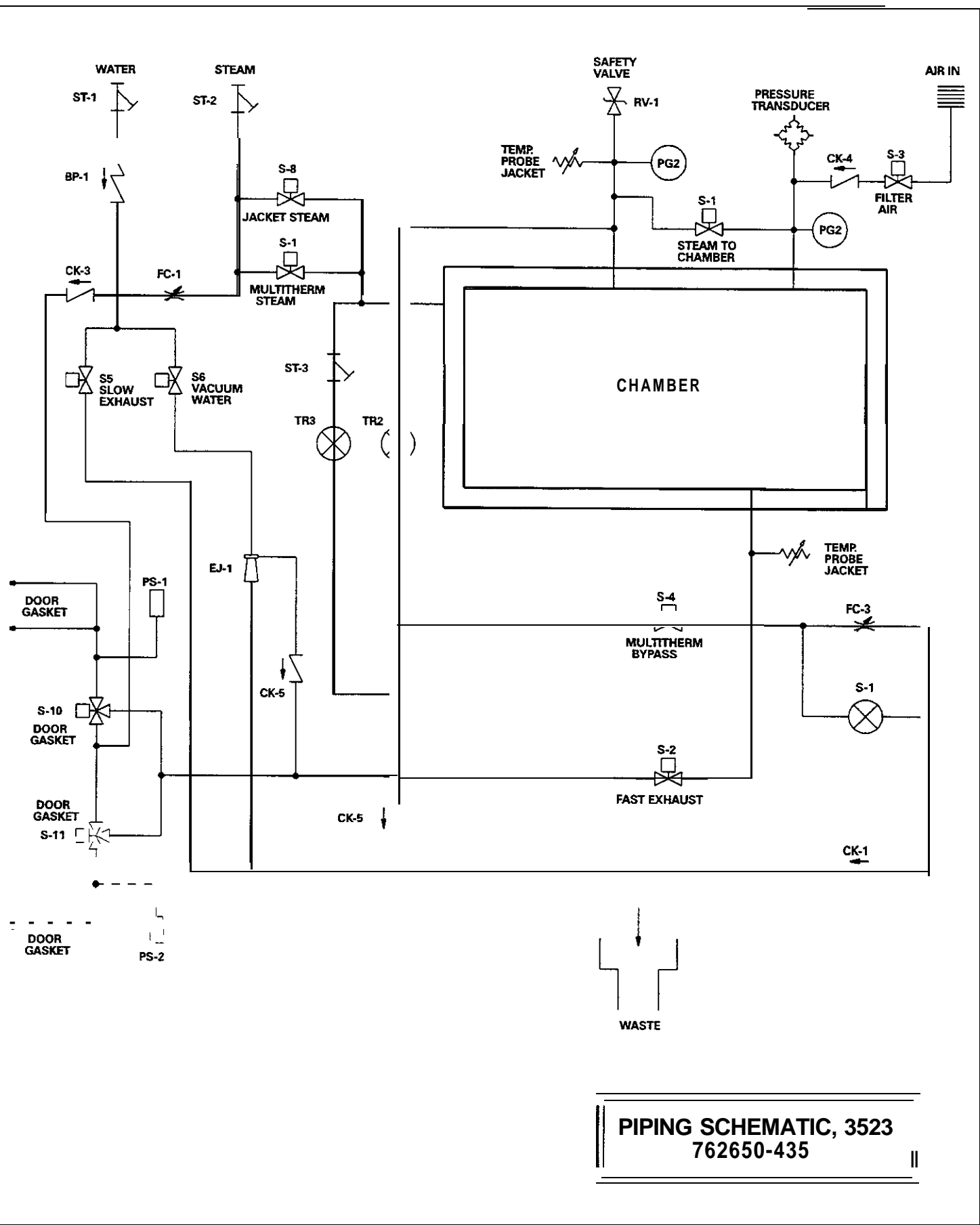


**PIPING SCHEMATIC, 3522
762650-410**

CASTLE 3522 PARTS LIST

SMALL GRAVITY STERILIZER

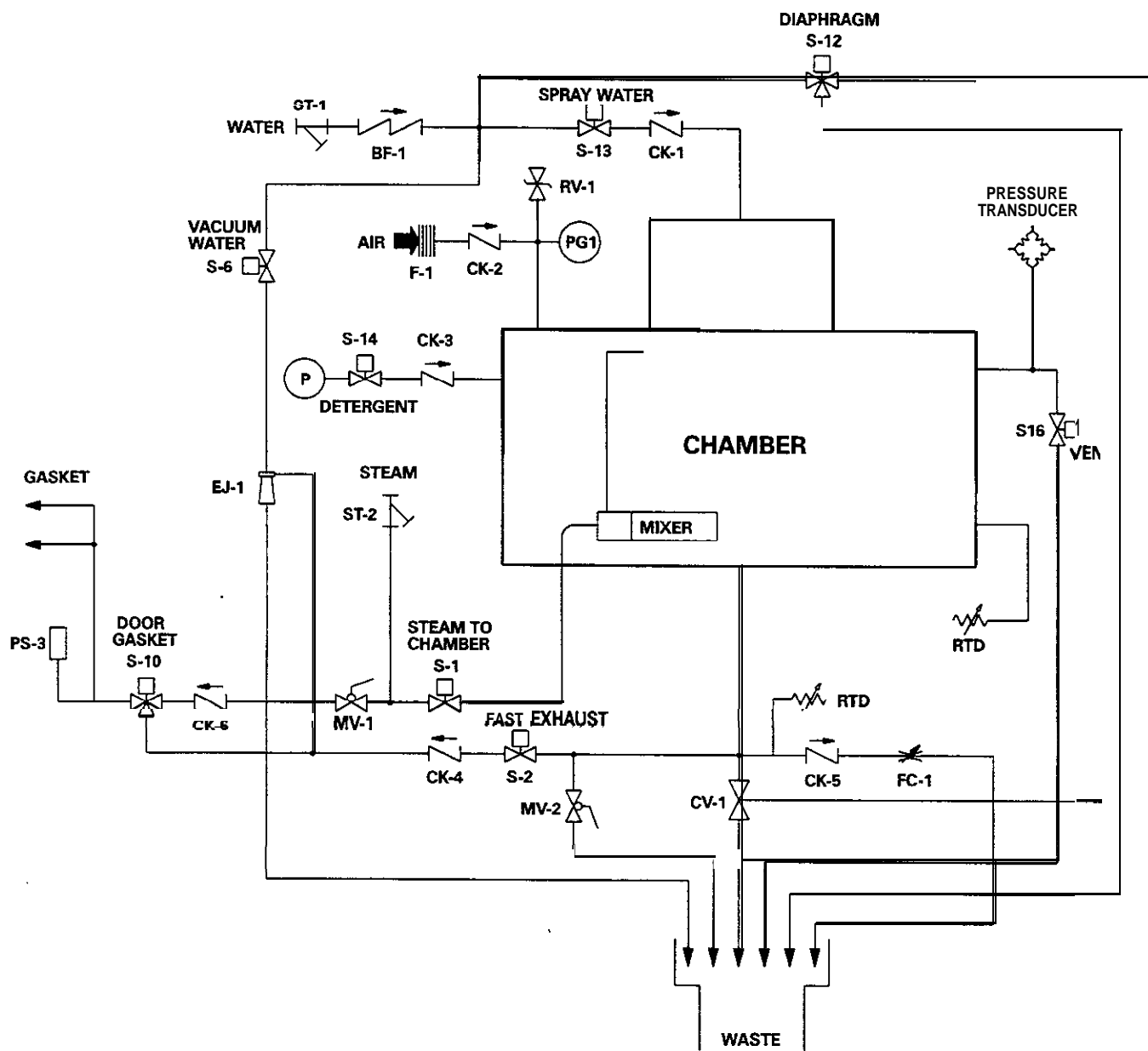
REF. NO.	AMSCO PART NO.	DESCRIPTION
BP-1	764323-800	BACKFLOW PREVENTER, 3/4"NPT
CK-1	764328-249	VALVE, CHECK 1/4"NPT
CK-2	764323.600	VALVE, CHECK 3/4"NPT
CK-3	101005.416	VALVE, CHECK 3/8"NPT
CK-4	101005.416	VALVE, CHECK 3/8"NPT
CK-5	101005.416	VALVE, CHECK 3/8"NPT
EJ-1	764328-246	EJECTOR, 3/4"NPT WATER
FC-1	764328-241	VALVE, FLOW CONTROL 1/8"NPT
FC-2	764328-241	VALVE, FLOW CONTROL 1/8"NPT
FC-3	764328.272	VALVE, FLOW CONTROL 3/8"NPT
FC-4	764326-241	VALVE, FLOW CONTROL 1/8"NPT
MV-1	764328-231	VALVE, BALL, 1/4"NPT
PG-1	764328-263	GAUGE, PRESSURE -30 TO 60 PSI 1/8"NPT (CHAMBER)
PG-2	764328-238	GAUGE, PRESSURE 0 TO 100 PSI 1/4"NPT (JACKET)
PS-1	764328-286	PRESSURE SWITCH
PS-2	764328-286	PRESSURE SWITCH
RV-1	56396-708	VALVE, SAFETY 1/2"NPT X 1"NPT
S-1	764328.533	VALVE, SOLENOID 3/8"NPT STEAM TO CHAMBER
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323.940	COIL, REPLACEMENT
s-2	764328-532	VALVE, SOLENOID 3/4"NPT FAST EXHAUST
	764328-534	REPAIR KIT, SOLENOID VALVE
	764323.941	COIL, REPLACEMENT
s-5	764328-521	VALVE, SOLENOID 1/4"NPT SLOW EXHAUST
	764328-522	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
S-6	764328-223	VALVE, SOLENOID 3/4"NPT VACUUM WATER
	764324-356	REPAIR KIT, SOLENOID VALVE
	764323.940	COIL, REPLACEMENT
S-8	764328-533	VALVE, SOLENOID 3/8"NPT JACKET STEAM
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
s-10	764328-224	VALVE, SOLENOID 1/4"NPT STEAM TO DOOR GASKET
	764328-225	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
s-11	764328-224	VALVE, SOLENOID 1/4"NPT STEAM TO DOOR GASKET
	764328-225	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
ST-1	910008-156	STRAINER, 1/2"NPT WATER
	910009-009	SCREEN, REPLACEMENT
ST-2	910008-156	STRAINER, 1/2"NPT STEAM
	910009-009	SCREEN, REPLACEMENT
ST-3	910008-156	STRAINER, 1/2"NPT
	910009-009	SCREEN, REPLACEMENT
TR-1	762115-001	TRAP, STEAM 1/2"NPT
TR-2	762115-001	TRAP, STEAM 1/2"NPT
	764328.360	PM PACK, SOLENOID VALVES
	764328-347	PM PACK, CHECK VALVES AND TRAPS
	764328-261	GASKET, DOOR (16 X 16) CHANNEL
	764328-262	GASKET, DOOR (20 X 20) CHANNEL
	764328-313	GASKET, DOOR (16 X 16) ROUND
	764328-314	GASKET, DOOR (20 X 20) ROUND



CASTLE 3523 PARTS LIST

SMALL GRAVITY/ISO STERILIZER

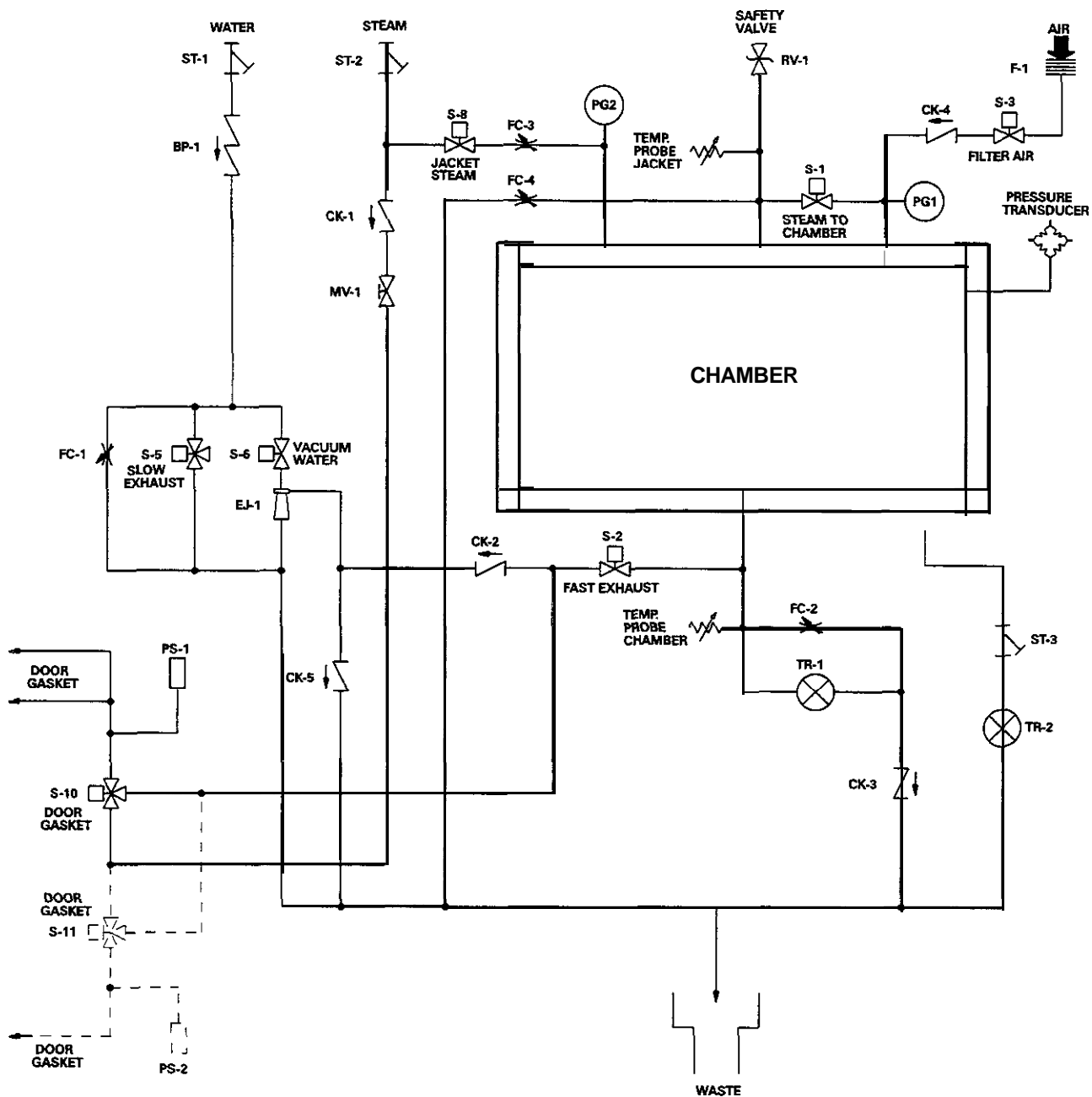
REF. NO.	AMSCO PART NO.	DESCRIPTION
BP-1	764323-800	BACKFLOW PREVENTER, 3, 4" NPT
CK-1	764320-492	VALVE, CHECK 1/2" NPT
CK-2	764323-800	VALVE, CHECK 3/4" NPT
CK-3	764328-249	VALVE, CHECK 1/4" NPT
CK-4	101005416	VALVE, CHECK 3/8" NPT
CK-5	764320492	VALVE, CHECK 1/2" NPT
N-1	764328-246	WECTOR, 3/4" NPT WATER
MV-2	764328-231	VALVE, BALL 1/4" NPT
MV-1	764328-231	VALVE, BALL 1/4" NPT
PG-1	764328-237	GAUGE, PRESSURE 0 TO 100 PSI 1/4" NPT
PG-2	764328-263	GAUGE, PRESSURE -30 TO 60 PSI 1/8" NPT
PS-1	764328-286	PRESSURE SWITCH
PS-2	764328-286	PRESSURE SWITCH
w-1	56396-708	VALVE, SAFETY 1/2" NPT X 1" NPT
S-1	764328-532	VALVE, SOLENOID 3/4" NPT STEAM TO CHAMBER
	764328-534	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
s-2	764328-532	VALVE, SOLENOID 3/4" NPT FAST EXHAUST
	764328-634	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
s-3	764328-533	VALVE, SOLENOID 3/8" NPT AIR
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-4	764328-533	VALVE, SOLENOID 3/8" NPT MULTITHERM BYPASS
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-5		NOT AVAILABLE
S-6	764328-223	VALVE, SOLENOID 3/4" NPT VACUUM WATER
	764324-356	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-7		NOT AVAILABLE
S-8	764328-633	VALVE, SOLENOID 3/8" NPT JACKET STEAM
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
s-10	764328-224	VALVE, SOLENOID 1/4" NPT STEAM TO DOOR GASKET
	764328-225	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
s-11	764328-224	VALVE, SOLENOID 1/4" NPT STEAM TO DOOR GASKET
	764328-225	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
ST-1	910008-386	STRAINER, 3/4" NPT WATER
	910009-017	SCREEN, REPLACEMENT
ST-2	910008-386	STRAINER, 3/4" NPT STEAM
	910009-017	SCREEN, REPLACEMENT
ST-3	910008-388	STRAINER, 3/4" NPT
	910009-017	SCREEN, REPLACEMENT
TR-1	782115-001	TRAP, STEAM 1/2" NPT
TR-2	762115-001	TRAP, STEAM 1/2" NPT
	764328-525	PM PACK, SOLENOID VALVES
	764328-509	PM PACK, CHECK VALVES AND TRAPS
	764328-261	GASKET, DOOR (16 X 16) CHANNEL
	764328-262	GASKET, DOOR (20 X 20) CHANNEL
	764328-313	GASKET, DOOR (16 X 18) ROUND
	764328-314	GASKET, DOOR (20 X 20) ROUND



**PIPING SCHEMATIC, 3525
762650-405**

CASTLE 3525 PARTS LIST SMALL WASHER STERILIZER

REF. NO.	AMSCO PART NO.	DESCRIPTION
BF-1	764323-800	BACKFLOW PREVENTER, 3/4"NPT
CK-1	764323-800	VALVE, CHECK 3/4"NPT(POPPET)
CK-2	764320492	VALVE, CHECK 1/2"NPT(POPPET)
CK-3	764325470	VALVE, CHECK 1/4"NPT(POPPET)
CK-4	764323-800	VALVE, CHECK 3/4"NPT(POPPET)
CK-5	764328-249	VALVE, CHECK 1/4"NPT(POPPET)
CK-6	764328-249	VALVE, CHECK 1/4"NPT(POPPET)
cv-1	764328-239	VALVE, DIAPHRAGM 1"NPT
EJ-1	764328-248	EJECTOR, WATER 3/4"NPT
F-I	764328-242	FILTER, AIR IN
FC-1	764328-241	VALVE, FLOW CONTROL 1/8"NPT X 1/4"OD
MV-1	764328-231	VALVE, BALL 1/4"NPT
MV-2	56401-096	VALVE, BALL 3/4"NPT
PG-1	764328-263	GAUGE, PRESSURE -30 TO 60 PSI 1/8"NPT
PS-3	764328-286	PRESSURE SWITCH
RV-1	66396708	VALVE, SAFETY 1/2"NPT X 1"NPT 40 PSIG
S-I	764328-633	VALVE, SOLENOID 3/8"NPT STEAM TO CHAMBER
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
s-2	784328-532	VALVE, SOLENOID 3/4"NPT FAST EXHAUST
	764328-634	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
S-8	784328-223	VALVE, SOLENOID 3/4"NPT VACUUM WATER
	784324-356	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
s-10	784328-224	VALVE, SOLENOID 1/4"NPT DOOR GASKET
	764328-225	REPAIR KIT, SOLENOID VALVE
	784323-841	COIL, REPLACEMENT
s-12	754328-621	VALVE, SOLENOID 1/4"NPT DIAPHRAGM
	764328-522	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
s-13	764328-223	VALVE, SOLENOID 3/4"NPT SPRAY WATER
	764324-356	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
s-14	764328-250	VALVE, SOLENOID 1/4"NPT DETERGENT
	764328-251	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-18	764328-533	VALVE, SOLENOID 3/8"NPT VENT
	754265.001	REPAIR KIT, SOLENOID VALVE
	76X323-940	COIL, REPLACEMENT
ST-1	910008-156	STRAINER, 1/2"NPT WATER
	910009-009	SCREEN, REPLACEMENT
ST-2	910008-156	STRAINER, 1/2"NPT STEAM
	910009-009	SCREEN, REPLACEMENT
	764328-348	PM PACK, SOLENOID VALVES
	764328-349	PM PACK, CHECK VALVES
	764328-281	GASKET, DOOR (16 X 16) CHANNEL
	764328-262	GASKET, DOOR (20 X 20) CHANNEL
	764328-313	GASKET, DOOR (16 X 16) ROUND
	764328-314	GASKET, DOOR (20 X 20) ROUND

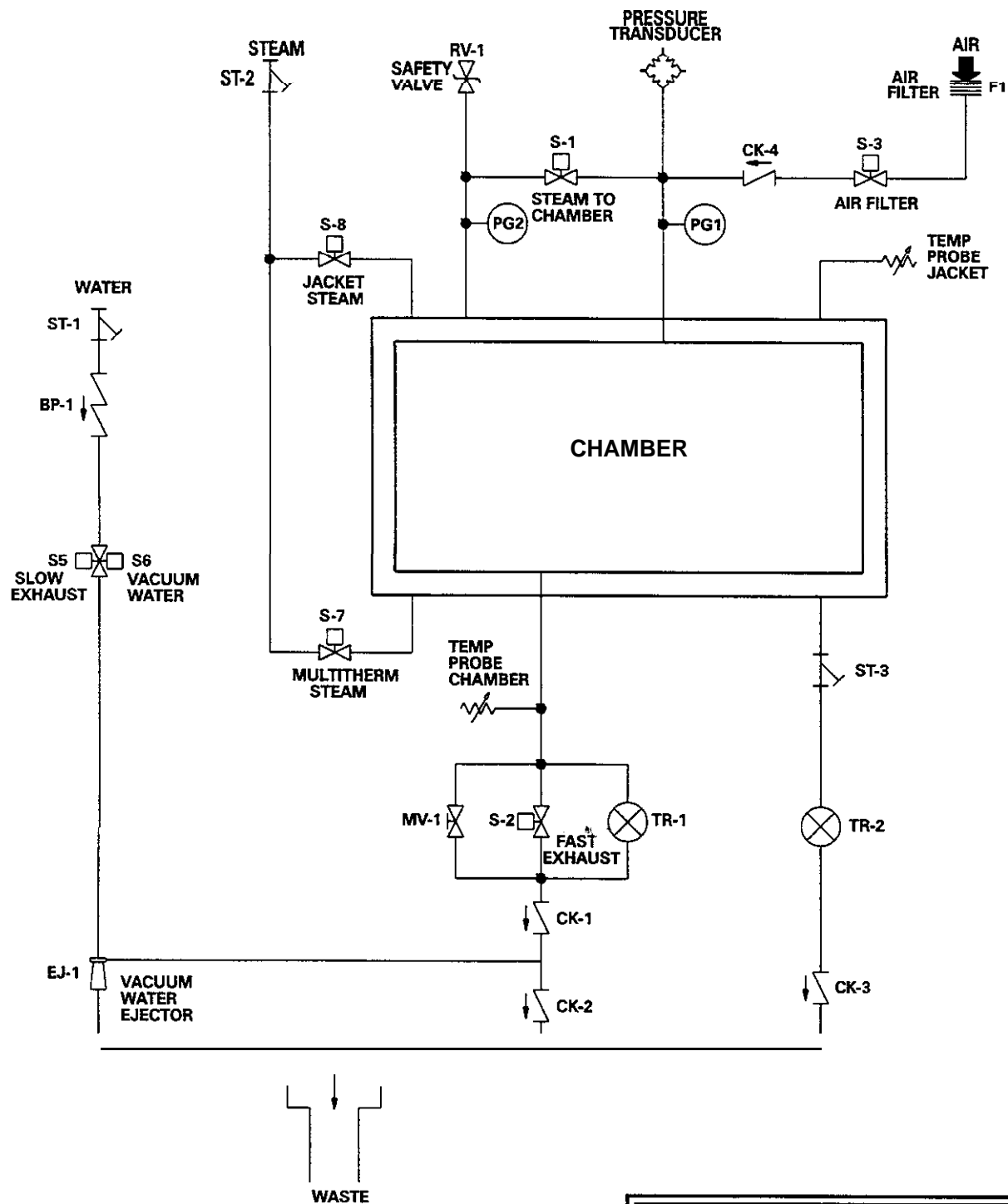


**PIPING SCHEMATIC, 3533
762650-404**

CASTLE 3533 PARTS LIST

SMALL VACAMATIC STERILIZER

REF. NO.	AMSCO PART NO.	DESCRIPTION
BP-1	764323-800	BACKFLOW PREVENTER, 3/4"NPT
CK-1	754329-249	VALVE, CHECK 1/4"NPT
CK-2	764323-800	VALVE, CHECK 3/4"NPT
CK-3	101005416	VALVE, CHECK 3/8"NPT
CK-4	101005-416	VALVE, CHECK 3/8"NPT
CK-5	101005-416	VALVE, CHECK 3/8"NPT
EJ-1	764329-245	EJECTOR, 3/4"NPT WATER
F-I	764329-242	FILTER, AIR IN
FC-1	764329-241	VALVE, FLOW CONTROL 1/8"NPT
FC-2	764329-241	VALVE, FLOW CONTROL 1/8"NPT
FC-3	764329-272	VALVE, FLOW CONTROL 3/8"NPT
FC-4	764328-241	VALVE, FLOW CONTROL 1/8"NPT
MV-1	764329-231	VALVE, BALL, 1/4"NPT
PG-1	764329-263	GAUGE, PRESSURE -30 TO 90 PSI 1/8"NPT (CHAMBER)
PG-2	764329-239	GAUGE, PRESSURE 0 TO 100 PSI 1/4"NPT (JACKET)
PS-1	764329-296	PRESSURE SWITCH
PS-2	764329-296	PRESSURE SWITCH
RV-1	56396-708	VALVE, SAFETY 1/2"NPT X 1"NPT
S-I	764329-533	VALVE, SOLENOID 3/8"NPT STEAM TO CHAMBER
	764265.001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
s-2	764329-532	VALVE, SOLENOID 3/4"NPT FAST EXHAUST
	754329-534	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
s-3	754329-533	VALVE, SOLENOID 3/8"NPT AIR FILTER
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
s-5	764329-521	VALVE, SOLENOID 1/4"NPT SLOW EXHAUST
	764329-522	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
S-6	764329223	VALVE, SOLENOID 3/4"NPT VACUUM WATER
	764324-355	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-9	754329-533	VALVE, SOLENOID 3/8"NPT JACKET STEAM
	754265.001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-IO	764329224	VALVE, SOLENOID 1/4"NPT STEAM TO DOOR GASKET
	764329-225	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
S-I 1	754329-224	VALVE, SOLENOID 1/4"NPT STEAM TO DOOR GASKET
	764329-225	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
ST-1	910008-156	STRAINER, 1/2"NPT WATER
	910009-009	SCREEN, REPLACEMENT
ST-2	910008-156	STRAINER, 1/2"NPT STEAM
	916609.009	SCREEN, REPLACEMENT
ST-3	910008-156	STRAINER, 1/2"NPT
	910009-009	SCREEN, REPLACEMENT
TR-1	762115.001	TRAP, STEAM 1/2"NPT
TR-2	762115-001	TRAP, STEAM 1/2"NPT
	764328-346	PM PACK, SOLENOID VALVES
	764329-347	PM PACK, CHECK VALVES AND TRAPS
	764328-261	GASKET, DOOR (16 X 16) CHANNEL
	764329-262	GASKET, DOOR (20 X 20) CHANNEL
	764329-313	GASKET, DOOR (16 X 16) ROUND
	764329-314	GASKET, DOOR 120 X 201 ROUND

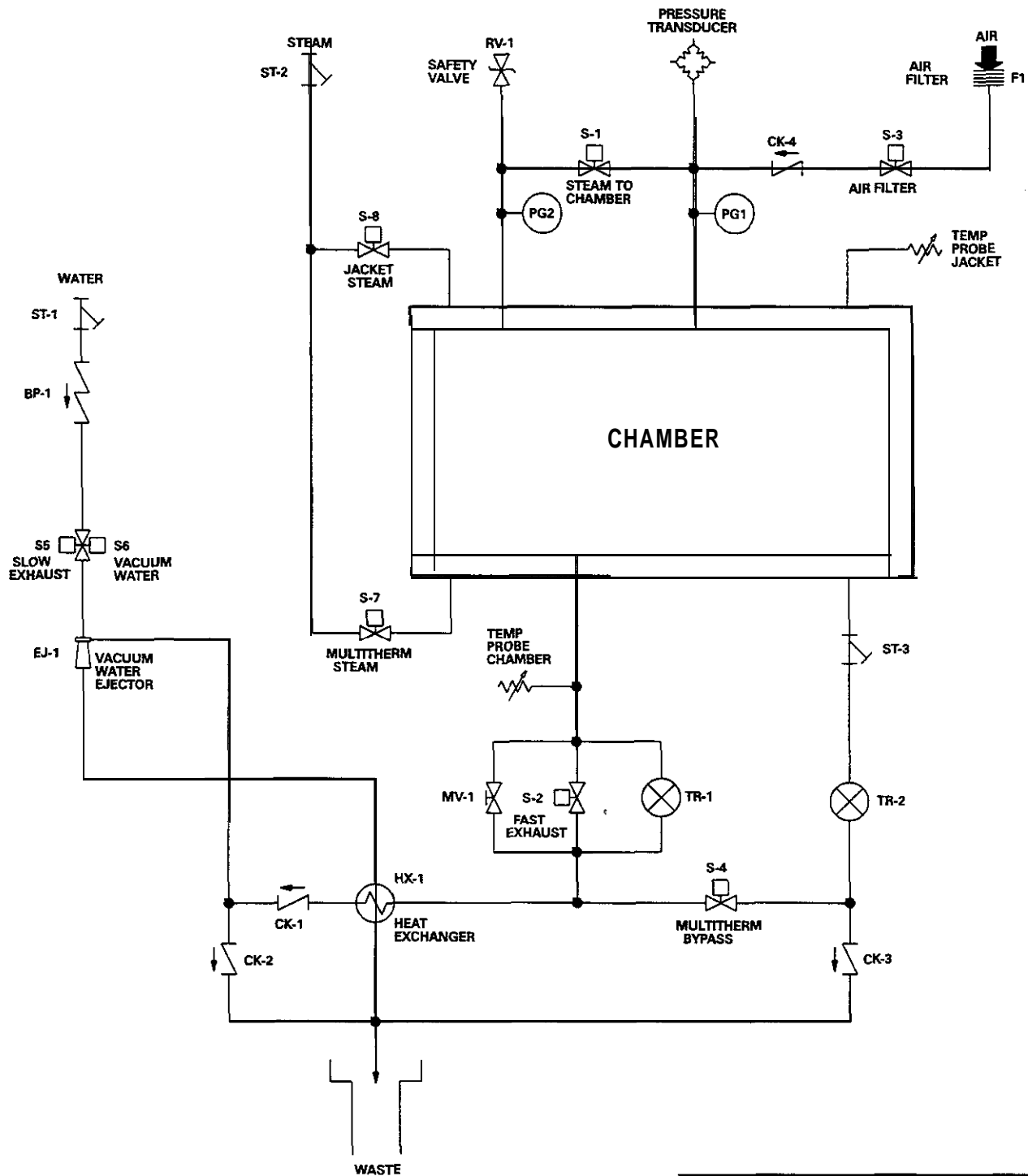


**PIPING SCHEMATIC, 3622
762650-397**

CASTLE 3622 PARTS LIST

MEDIUM GRAVITY STERILIZER

REF. NO.	AMSCO PART NO.	DESCRIPTION
BP-I	764328-210	BACKFLOW PREVENTER, 1"NPT
CK-1	764328-210	VALVE, CHECK 1"NPT
CK-2	764323-800	VALVE, CHECK 3/4"NPT
CK-3	764320492	VALVE, CHECK 1/2"NPT
CK-4	764323-800	VALVE, CHECK 3/4"NPT
EJ-1	764328.247	EJECTOR, 1"NPT WATER
F-I	764328-242	FILTER, AIR IN
MV-1	764328-230	VALVE, BALL 1/2"NPT
PG-1	764328-237	GAUGE, PRESSURE 0 TO 100 PSI 1/4"NPT (JACKET)
PG-2	764328.263	GAUGE, PRESSURE -30 TO 80 PSI 1/8"NPT (CHAMBER)
RV-1	150828-476	VALVE, SAFETY 3/4"NPT X 1"NPT
S-I	83229-002	VALVE, SOLENOID 1"NPT STEAM TO CHAMBER
	764671-001	REPAIR KIT, SOLENOID VALVE
	764671.002	COIL, REPLACEMENT
s-2	83229-002	VALVE, SOLENOID 1"NPT FAST EXHAUST
	764071-001	REPAIR KIT, SOLENOID VALVE
	764071-002	COIL, REPLACEMENT
s-3	764328-227	VALVE, SOLENOID 3/4"NPT AIR FILTER
	764328-228	REPAIR KIT, SOLENOID VALVE
	764323-841	COIL, REPLACEMENT
S-5/S-6		NOT AVAILABLE
s-7	764328.533	VALVE, SOLENOID 3/8"NPT MULTITHERM STEAM
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323.940	COIL, REPLACEMENT
S-8	764328-536	VALVE, SOLENOID 3/4"NPT JACKET STEAM
	910006443	REPAIR KIT, SOLENOID VALVE
	764323-942	COIL, REPLACEMENT
ST-1	129362-472	STRAINER, 1"NPT WATER
	764326-664	SCREEN, REPLACEMENT
ST-2	129362472	STRAINER, 1"NPT STEAM
	764326-664	SCREEN, REPLACEMENT
ST-3	910008-386	STRAINER, 3/4"NPT
	910009-017	SCREEN, REPLACEMENT
TR-1	764328-463	TRAP, 3/4"NPT STEAM 30 PSI
TR-2	762116.001	TRAP, 1/2"NPT
	764328-338	PM PACK, SOLENOID VALVES
	764328-339	PM PACK, CHECK VALVES AND TRAPS
	764328-267	GASKET, DOOR



**PIPING SCHEMATIC, 3633
762650-399**

CASTLE 3633 PARTS LIST

MEDIUM VACAMATIC STERILIZER

REF. NO.	AMSCO PART NO.	DESCRIPTION
BP-1	764328-210	BACKFLOW PREVENTER, 1"NPT
CK-1	764328-210	VALVE, CHECK 1"NPT
CK-2	764323-800	VALVE, CHECK 3/4"NPT
CK-3	764320492	VALVE, CHECK 1/2"NPT
CK-4	764323-800	VALVE, CHECK 3/4"NPT
EJ-1	764328-247	WECTOR, 1"NPT WATER
F-1	764328-242	FILTER, AIR IN
HX-1	764328-232	HEAT EXCHANGER
MV-1	764328-230	VALVE, BALL 1/2"NPT
PG-1	764328-237	GAUGE, 0 TO 100 PSI 1/4"NPT (JACKET)
PG-2	764328-263	GAUGE, -30 TO 60 PSI 1/8"NPT (CHAMBER)
RV-1	150828-476	VALVE, SAFETY 3/4"NPT X 1"NPT
S-1	83229-002	VALVE, SOLENOID 1"NPT STEAM TO CHAMBER
	764071-001	REPAIR KIT, SOLENOID VALVE
	764071-002	COIL, REPLACEMENT
s-2	83229-002	VALVE, SOLENOID 1"NPT FAST EXHAUST
	764071-001	REPAIR KIT, SOLENOID VALVE
	764071-002	COIL, REPLACEMENT
s-3	764328-227	VALVE, SOLENOID 3/4"NPT AIR FILTER
	764328-228	REPAIR KIT, SOLENOID VALVE
	764323-941	COIL, REPLACEMENT
S-4	764328-533	VALVE, SOLENOID 3/8"NPT MULTITHERM BYPASS
	764265001	REPAIR KIT, SOLENOID VALVE
	764323-940	COIL, REPLACEMENT
S-5/S-6		NOT AVAILABLE
s-7	764328-533	VALVE, SOLENOID 3/8"NPT MULTITHERM STEAM
	764265-001	REPAIR KIT, SOLENOID VALVE
	764323-946	COIL, REPLACEMENT
S-8	764328-536	VALVE, SOLENOID 3/4"NPT JACKET STEAM
	910006-343	REPAIR KIT, SOLENOID VALVE
	764323-942	COIL, REPLACEMENT
ST-1	129362472	STRAINER, 1"NPT WATER
	764326664	SCREEN, REPLACEMENT
ST-2	128362472	STRAINER, 1"NPT STEAM
	764326-664	SCREEN, REPLACEMENT
ST-3	910008-386	STRAINER, 3/4"NPT
	910609-017	SCREEN, REPLACEMENT
TR-1	764328-463	TRAP, 3/4"NPT STEAM 30 PSI
TR-2	762115-001	TRAP, 1/2"NPT
	764328-341	PM PACK, SOLENOID VALVES
	764328-339	PM PACK, CHECK VALVES AND TRAPS
	764328-267	GASKET, DOOR

SECTION 3 . . . CYCLE THEORY

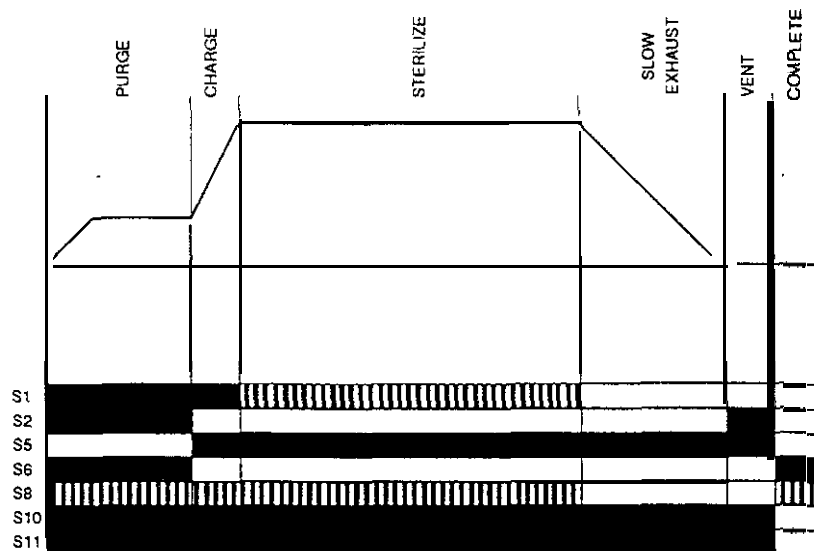
, , 3522 Gravity (small)

- . Liquids Cycle
- . Unwrapped Cycle
- . Wrapped Cycle
- . Multitherm Cycle

. , 353313633 Prevac

- . Liquids Cycle
- . Unwrapped Cycle
- . Wrapped Cycle
- , Leak Test

3522 LIQUIDS CYCLE



16" - 60 Seconds
20" - 90 Seconds

Cycle Start

When the control is initially turned on, S2 (Fast Exhaust), S3 (Filter Air) and S8 (Steam to Jacket) are turned on. S8 (Steam to Jacket) will remain on until the jacket reaches the set temperature of the cycle. The Jacket RTD maintains this temperature by controlling the S8 (Steam to Jacket). The cycle cannot be started until the Jacket reaches this temperature. If the exposure temperature is below 100 °C the Jacket is not preheated.

Door Seal

Solenoid S10 (Door Seal) is turned on allowing steam to enter the gasket area of the single or double door seal. When S10 (Door Seal 3 Way) is turned on, the door seal is disconnected from the ejector. If the Unidirection option is installed, S10 (Door Seal) operates the seal on the operating end of the unit and the S11 (Door Seal) operates the seal on the non-operating end of the unit.

Purge

S1 (Steam to Chamber), S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on for (16" 60 sec 20" - 90 sec). This forces the air out of the chamber. At the end of the preset time, S2 (Fast Exhaust) and S6 (Vacuum Water) are turned off.

Note: If unit is a 36" unit, the cycle proceeds to the Charge phase.

Alarms: Code 75 • Cycle does not start correctly

Charge

After Condition is complete, S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned on. The chamber is charged with steam until the selected setpoint is attained.

Alarms: Code 06 Too long to achieve exposure setpoint during the Charge Phase.

Sterilize

When exposure temperature setpoint is attained S1 (Steam to Chamber) turns off. The S1 valve turns on and off maintaining the setpoint within a temperature window.

Alarms: Code 10 Undertemp

Code 14 • Overtemp

Code 47 • Chamber Pressure value incorrect

Slow Exhaust

At the end of the exposure time, S1 (Steam to Chamber) and S8 (Steam to Jacket) are turned off. S5 (Slow Exhaust) is turned on. The chamber is exhausted to atmospheric pressure through FC2 and FC4. S2 (Fast Exhaust) is turned on for a timed period just before the chamber is at atmospheric pressure. Jacket pressure is removed through the trap.

Alarms: Code 16 • Too long to exhaust

Vent

S2 (Fast Exhaust) is turned on for a set period of time along with S5 (Slow Exhaust).

Alarm: Code 20 • Chamber above or below atmospheric at end of cycle

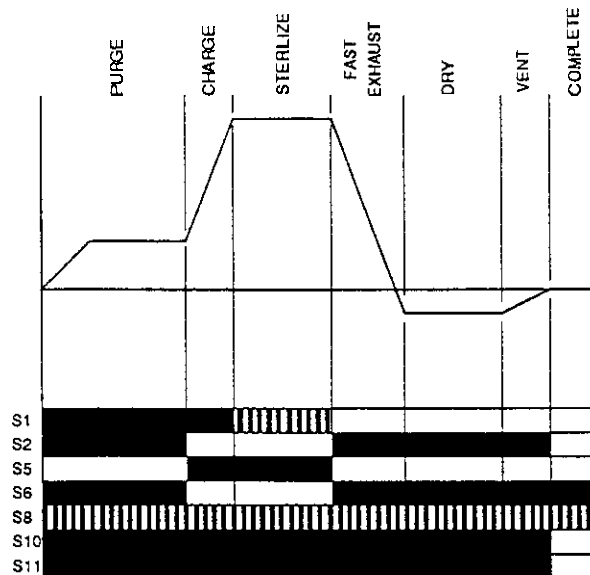
Door Gasket Unseal

Solenoid S10 (Door Seal) is turned off. S6 (Vacuum Water) is turned on creating a vacuum on the gasket area through S10 (Door Seal) retracting the seal into the end ring groove. It takes 30 seconds to retract the door seal.

Complete

Buzzer will turn on and S2 (Fast Exhaust) and S3 (Filtered Air) Turn on

3522 UNWRAPPED CYCLE



UNWRAPPED CYCLE (16" Units Only)

Cycle Start

When the control is initially turned on, S2 (Fast Exhaust), S3 (Filter Air) and S8 (Steam to Jacket) turn on. S8 (Steam to Jacket) will remain on until the jacket reaches the set temperature of the cycle. The Jacket RTD maintains this temperature by controlling the S8 (Steam to Jacket). The cycle cannot be started until the Jacket reaches this temperature.

Door Seal

Solenoid S10 (Door Seal) is turned on allowing steam to enter the gasket area behind the door seals. When the S10 (Door Seal 0) is turned on the gasket is disconnected from the ejector. If the Unidirectional option is installed S10 (Door Seal 0) operates the seal on the operating end and the S11 (Door Seal 1) operates the seal on the non-operating end.

Purge

S1 (Steam to Chamber), S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on for (60 sec). This forces the air out of the chamber. At the end of the preset time, S2 (Fast Exhaust) and S6 (Vacuum Water) are turned off.

Alarms: Code 75 - Cycle does not start correctly

Charge

After Condition is complete, S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned on. The chamber is charged with steam until the selected setpoint is attained.

Alarms: Code 06 - Too long to achieve exposure setpoint during the Charge Phase.

Sterilize

When exposure temperature setpoint is attained S1 (Steam to Chamber) turns off. The S1 valve turns on and off maintaining the setpoint within a temperature window.

Alarms: Code 10 - Undertemp

Code 14 - Overtemp

Code 47 Chamber Pressure value incorrect

Exhaust

At the end of the exposure time, S1 (Steam to Chamber), S5 (Slow Exhaust) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on. The chamber is evacuated to atmospheric pressure.

Alarms: Code 02 - Too long to pull a vacuum

Code 16 - Too long to exhaust

Dry

Both S2 (Fast Exhaust) and S6 (Vacuum Water) remain on during the entire Dry time selected.

Vent

S2 (Fast Exhaust) turns off at the completion of the Dry time.

Alarm: Code 20 - Chamber above or below atmospheric at end of cycle

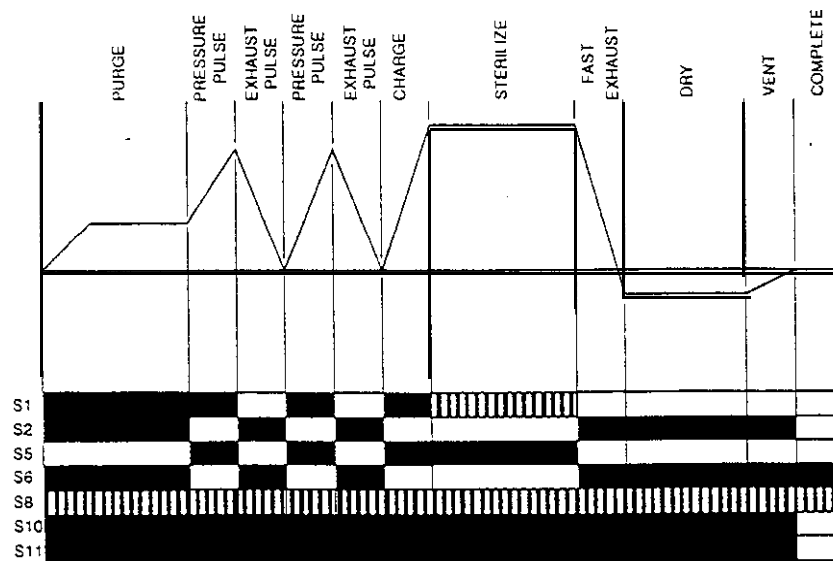
Door Gasket Unseal

Solenoid S10 (Door Seal 0 & 1) is turned off. S6 (Vacuum Water) is turned on creating a vacuum on the gasket area behind the seal retracting it into the end ring groove. It takes 30 seconds to retract the door seal.

Complete

Buzzer and S2 (Fast Exhaust) turn an.

3522 WRAPPED CYCLE



Cycle Start

When the control is initially turned on, S2 (Fast Exhaust), S3 (Filter Air) and S8 (Steam to Jacket) turn on. S8 (Steam to Jacket) will remain on until the jacket reaches the set temperature of the cycle. The Jacket RTD maintains this temperature by controlling the S8 (Steam to Jacket). The cycle cannot be started until the Jacket reaches this temperature.

Door seal

Solenoid S10 (Door Seal) is turned on allowing steam to enter the gasket area behind the door seals. When the S10 (Door Seal 0) is turned on the gasket is disconnected from the ejector. If the Unidirectional option is installed, S10 (Door Seal 0) operates the seal on the operating end and the S11 (Door Seal 1) operates the seal on the non-operating ad.

Purge

S1 (Steam to Chamber), S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on for (60 sec). This forces the air out of the chamber. At the end of the preset time, S2 (Fast Exhaust) and S6 (Vacuum Water) are turned off.

Alarms: Code 75 Cycle does not start correctly

Charge

After Condition is complete, S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned on. The chamber is charged with steam until the selected setpoint is attained.

Alarms: Code 06 Too long to achieve exposure setpoint during the Charge Phase.

Sterilize

When exposure temperature setpoint is attained, S1 (Steam to Chamber) turns off. The S1 valve turns on and off maintaining the setpoint within a temperature window. Alarms: Code 10 Undertemp

Code 14 • Overtemp

Code 47 • Chamber Pressure value incorrect

Exhaust

At the end of the exposure time, S1 (Steam to Chamber), S5 (Slow Exhaust) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on. The chamber is evacuated to atmospheric pressure.

Alarms: Code 02 Too long to pull a vacuum

Code 16 - Too long to exhaust

Dry

Both S2 (Fast Exhaust) and S6 (Vacuum Water) remain on during the entire Dry time selected.

Vent

S2 (Fast Exhaust) turns off at the completion of the Dry time.

Alarm: Code 20 Chamber above or below atmospheric at end of cycle

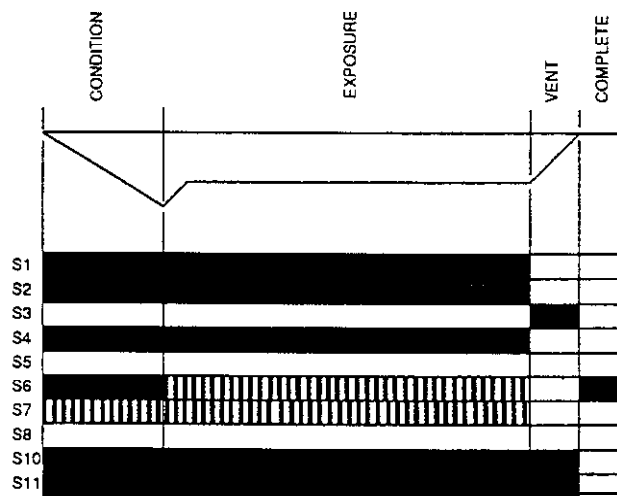
Door Gasket Unseal

Solenoid S10 (Door Seal 0 & 1) is turned off. S6 (Vacuum Water) is turned on creating a vacuum on the gasket area behind the seal rearing it into the end ring groove. It takes 30 seconds to retract the door seal.

Complete

Buzzer and S2 (Fast Exhaust) turn on

3523 MULTITHERM CYCLE



Start

When the control is initially turned on, S2 (Fast Exhaust), S3 (Filter Air) and S8 (Stem to Jacket) are turned on. If the exposure temperature is below 100° C, the Jacket is not preheated.

Door Seal

Solenoid S10 (Door Seal) is turned on allowing steam to enter the gasket area of the single or double door seal. When S10 (Door Seal 3 Way) is turned on, the door seal is disconnected from the ejector. If the Unidirection option is installed, S10 (Door Seal) operates the seal on the operating end of the unit and the S11 (Door Seal) operates the seal on the non-operating end of the unit.

Precondition

There is a 5 second delay at the beginning of the cycle. S1 (Steam to Chamber), S2 (Fast Exhaust), S4 (Multitherm Bypass), S6 (Vacuum Water) and S7 (Multitherm Stem) are turned on. The Jacket RTD maintains the chamber temperature by controlling the S7 (Multitherm Steam). When the chamber pressure falls below the operating pressure, S6 (Vacuum Water) and S7 (Multitherm Stem) turn off.

Sterilize

The set sterilize time starts, when the chamber RTD reaches the set temperature. The Jacket RTD controls the S6 (Vacuum Water) and S7 (Multitherm Steam) to maintain the chamber conditions. The S6 (Vacuum Water) and the S7 (Multitherm Steam) operate opposite each other. When one is on the other is off.

Vent

At the end of the set sterilize time, S1 (Steam to Chamber), S2 (Fast Exhaust) and S4 (Multitherm Bypass) are turned off. S3 (Filter Air) is turned on venting the chamber to atmosphere. S3 is turned off when the chamber reaches atmosphere.

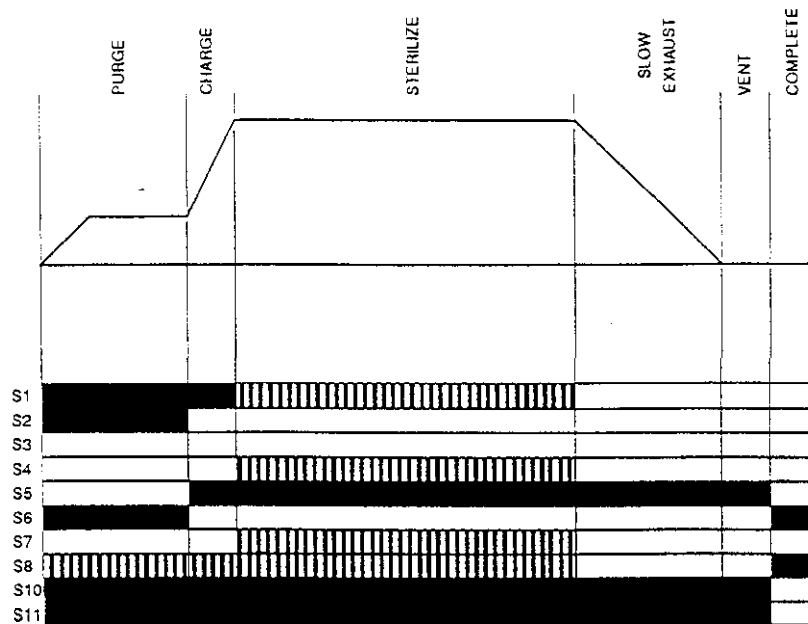
Door Gasket Unseal

Solenoid S10 (Door Seal) is turned off. S6 (Vacuum Water) is turned on nearing a vacuum on the gasket area through S10 (Door Seal) retracting the red into the end ring groove. It takes 30 seconds to retract the door seal.

Complete

Buzzer will turn on and S2 (Fast Exhaust) and S3 (Filtered Air) Turn on.

3533 - 3633 LIQUIDS CYCLE



LIQUIDS CYCLE

Cycle Start

When the control is initially turned on, S2 (Fast Exhaust), S3 (Filter Air) and S8 (Steam to Jacket) turn on. SX (Steam to Jacket) will remain on until the jacket reaches the set temperature of the cycle. The Jacket RTD maintains this temperature by controlling the SX (Steam to Jacket). The cycle cannot be started until the Jacket reaches this temperature. If the exposure temperature is below 100 °C, the Jacket is not preheated.

Door Seal

Solenoid S10 (Door Seal) is turned on allowing steam to enter the gasket area of the single or double door seal. When S10 (Door Seal 3 Way) is turned on, the door seal is disconnected from the ejector. If the Unidirection option is installed, S10 (Door Seal) operates the seal on the operating end of the unit and the S11 (Door Seal) operates the seal on the non-operating end of the unit.

Purge

S1 (Steam to Chamber), S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on for (16" • 60 sec 20" 90 sec). This forces the air out of the chamber. At the end of the preset time, S2 (Fast Exhaust) and S6 (Vacuum Water) are turned off.

Note: If unit is a 36" unit, the cycle proceeds to the Charge phase.

Alarms: Code 75 Cycle does not start correctly

Charge

After Condition is complete, S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned on. The chamber is charged with steam until the selected setpoint is attained.

Alarms: Code 06 - Too long to achieve exposure setpoint during the Charge Phase.

Sterilize

When exposure temperature setpoint is attained, S1 (Steam to Chamber) turns off. The S1 valve turns on and off maintaining the setpoint within a temperature window.

Alarms: Code 10 - Undertemp

Code 14 Overtemp

Code 47 Chamber Pressure value incorrect

Slow Exhaust

At the end of the exposure time, S1 (Steam to Chamber), S8 (Steam to Jacket) are turned off. S5 (Slow Exhaust) is turned on. The chamber is exhausted to atmospheric pressure through FC2 and FC4. Jacket pressure is removed through the trap.

Alarms: Code 16 - Too long to exhaust

Vent

S2 (Fast Exhaust) is turned on for a set period of time along with S5 (Slow Exhaust).

Alarm: Code 20 Chamber above or below atmospheric at end of cycle

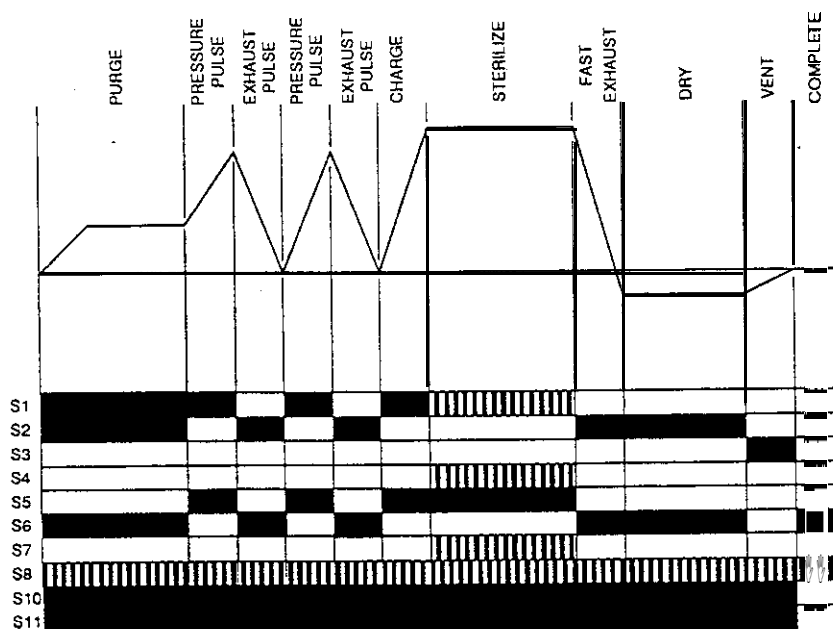
Door Gasket Unseal

Solenoid S10 (Door Seal) is turned off. S6 (Vacuum Water) is turned on creating a vacuum on the gasket area through S10 (Door Seal) retracting the seal into the end ring groove. It takes 30 seconds to retract the door seal.

Complete

Buzzer will turn on and S2 (Fast Exhaust) and S3 (Filtered Air) Turn on

3533/3633
UNWRAPPED CYCLE



Cycle Start

When the control is initially turned on, S2 (Fast Exhaust), S3 (Filter Air) and S8 (Steam to Jacket) turn on. S8 (Steam to Jacket) will remain on until the jacket reaches the set temperature of the cycle. The Jacket RTD maintains this temperature by controlling the S8 (Steam to Jacket). The cycle cannot be started until the Jacket reaches this temperature.

Purge

S1 (Steam to Chamber), S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on for (36" • 90 sec 48"/60" - 120 sec). This forces the air out of the chamber. At the end of the preset time, S2 (Fast Exhaust) and S6 (Vacuum Water) are turned off.

Note: If unit is a 36" size chamber, the cycle proceeds to the Charge phase

Alarms: Code 75 - Cycle does not start correctly

Pressure Pulse (1)

S1 (Steam to Chamber) remains open. S5 (Slow Exhaust) opens allowing cooling water to condense the steam from the chamber. The setpoint of the pressure pulse is directly related to the cycle exposure setpoint and varies from cycle to cycle. Once the setpoint is made, the cycle advances to the Vacuum Pulse phase.

Alarms: Code 04 - Too long to attain setpoint (5 min) during a Pressure Pulse

Exhaust Pulse (1)

S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on exhausting the chamber until atmospheric pressure is reached. S2 (Fast Exhaust) and S6 (Vacuum Water) are then turned off.

Alarms: Code 02 - Too long to pull a vacuum

Pressure Pulse (2)

S1 (Steam to Chamber) remains open. S5 (Slow Exhaust) opens allowing cooling water to condense the steam from the chamber. The setpoint of the pressure pulse is directly related to the cycle exposure setpoint and varies from cycle to cycle. Once the setpoint is made, the cycle advances to the Vacuum Pulse phase.

Alarms: Code 04 - Too long to attain setpoint (5 min) during a Pressure Pulse

Exhaust Pulse (2)

S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on exhausting the chamber until atmospheric pressure is reached. S2 (Fast Exhaust) and S6 (Vacuum Water) are then turned off.

Alarms: Code 02 - Too long to pull a vacuum

Charge

After Condition is complete, S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned on. The chamber is charged with steam until the selected setpoint is attained.

Alarms: Code 06 - Too long to achieve exposure setpoint during the Charge Phase.

Sterilize

When exposure temperature setpoint is attained, S1 (Stem to Chamber) turns off. The S1 valve turns on and off maintaining the setpoint within a temperature window. If the unit is equipped with a S7 (Multitherm Steam) and a S4 (Multitherm Bypass), these 2 valves turn off and on with the S1 to maintain the correct exposure temperature.

Alarms: Code 10 • Undertemp

Code 14 • Overtemp

Code 47 • Chamber Pressure value incorrect

Exhaust

At the end of the exposure time. S1 (Stem to Chamber), S5 (Slow Exhaust). S4 (Multitherm Bypass) and S7 (Multitherm Steam) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on. The chamber is evacuated to atmospheric pressure.

Alarms: Code 02 - Too long to pull a vacuum

Code 16 - Too long to exhaust

Dry

Both S2 (Fast Exhaust) and S6 (Vacuum Water) remain on during the entire Dry time selected. S3 (Filtered Air) is turned on. The Chamber remains at atmospheric pressure for the remainder of the Dry time.

Vent

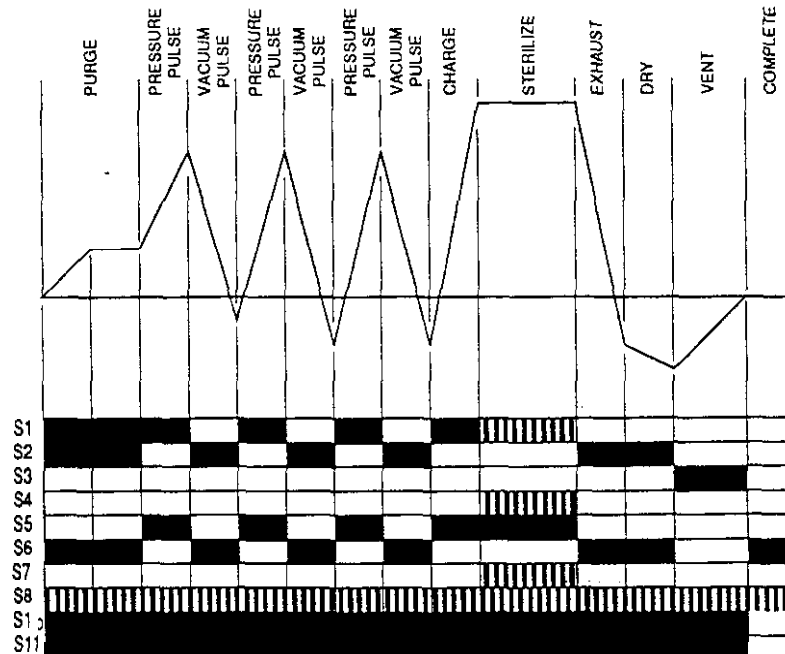
S2 (Fast Exhaust) and S6 (Vacuum Water) turn off and the completion of the Dry time. S3 (Filtered Air) turns on and vents the chamber back up to atmospheric pressure.

Alarm: Code 20 • Chamber above or below atmospheric at end of cycle

Complete

Buzzer will turn on and S2 (Fast Exhaust) and S3 (Filtered Air) Turn a.

3533 - 3633 WRAPPED CYCLE



Cycle Start

When the control is initially turned on. S2 (Fast Exhaust), S3 (Filter Air) and S8 (Steam to Jacket) turn on. S8 (Steam to Jacket) will remain on until the jacket reaches the set temperature of the cycle. The Jacket RTD maintains this temperature by controlling the S8 (Steam to Jacket). The cycle cannot be started until the Jacket reaches this temperature.

Purge

S1 (Steam to Chamber), S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on for $(36'' \cdot 90 \text{ sec } 48''/60'' - 120 \text{ sec})$. This forces the air out of the chamber. At the end of the preset time, S2 (Fast Exhaust) and S6 (Vacuum Water) are turned off.

Alarms: Code 75 Cycle does not start correctly

Pressure Pulse (1)

S1 (Steam to Chamber) remains open. S5 (Slow Exhaust) opens allowing cooling water to condense the steam from the chamber. The setpoint of the pressure pulse is directly related to the cycle exposure setpoint and varies from cycle to cycle. Once the setpoint is made, the cycle advances to the Vacuum Pulse phase.

Alarms: Code 04 - Too long to attain setpoint (5 min) during a Pressure Pulse

Vacuum Pulse (1)

S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on exhausting the chamber until the setpoint of 9.6 PSIA is reached. S2 (Fast Exhaust) and S6 (Vacuum Water) are then turned off.

Alarms: Code 07 - Too long to pull a vacuum

Pressure Pulse (2)

S1 (Steam to Chamber) turns on. S5 (Slow Exhaust) opens allowing cooling water to condense the steam from the chamber. The setpoint of the pressure pulse is directly related to the cycle exposure setpoint and varies from cycle to cycle. Once the setpoint is made, the cycle advances to the Vacuum Pulse phase.

Alarms: Code 04 - Too long to attain setpoint (5 min) during a Pressure Pulse

Vacuum Pulse (2)

S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on exhausting the chamber until the setpoint of 4.8 PSIA is reached. S2 (Fast Exhaust) and S6 (Vacuum Water) are then turned off.

Alarms: Code 02 - Too long to pull a vacuum

Pressure Pulse (3)

S1 (Steam to Chamber) turns on. S5 (Slow Exhaust) opens allowing cooling water to condense the steam from the chamber. The setpoint of the pressure pulse is directly related to the cycle exposure setpoint and varies from cycle to cycle. Once the setpoint is made, the cycle advances to the Vacuum Pulse phase.

Alarms: Code 04 - Too long to attain setpoint (5 min) during a Pressure Pulse

Vacuum Pulse (3)

S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on exhausting the chamber until the setpoint of 4.8 PSIA is reached. S2 (Fast Exhaust) and S6 (Vacuum Water) are then turned off.

Alarms: Code 02 - Too long to pull a vacuum

Charge

After Condition is complete. S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned on. The chamber is charged with steam until the selected setpoint is attained.

Alarms: Code 06 - Too long to achieve exposure setpoint during the Charge Phase.

Exposure

When exposure temperature setpoint is attained, S1 (Steam to Chamber) turns off. The S1 valve turns on and off maintaining the setpoint within a temperature window. If the unit is equipped with a S7 (Multitherm Steam) and a S4 (Multitherm Bypass), these 2 valves turn off and on with the S1 to maintain the correct exposure temperature.

Alarms: Code 10 - Undertemp

Code 14 Overtemp

Code 47 Chamber Pressure value incorrect

Exhaust

At the end of the exposure time, S1 (Steam to Chamber), S5 (Slow Exhaust), S4 (Multitherm Bypass) and S7 (Multitherm Steam) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on. The chamber is evacuated to below atmospheric pressure.

Alarms: Code 02 - Too long to pull a vacuum

Code 16 - Too long to exhaust

Dry

Both S2 (Fast Exhaust) and S6 (Vacuum Water) remain on during the entire Dry time selected

Vent

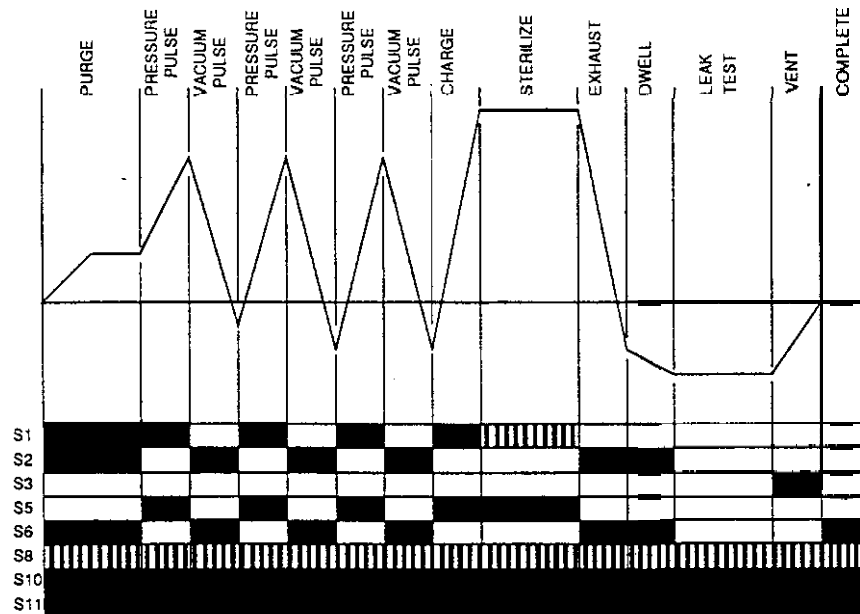
S2 (Fast Exhaust) and S6 (Vacuum Water) turn off and the completion of the Dry time. S3 (Filtered Air) turns on and vents the chamber back up to atmospheric pressure.

Alarm: Code 20 Chamber above or below atmospheric at end of cycle

Complete

Buzzer will mm on and S2 (Fast Exhaust) and S3 (Filtered Air) Turn on.

3533 LEAK TEST



Cycle start

When the control is initially turned on, S2 (Fast Exhaust), S3 (Filter Air) and S8 (Steam to Jacket) turn on. S8 (Steam to Jacket) will remain on until the jacket reaches the set temperature of the cycle. The Jacket RTD maintains this temperature by controlling the S8 (Steam to Jacket). The cycle cannot be started until the Jacket reaches this temperature.

Purge

S1 (Steam to Chamber), S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on for (36" 90 sec 48"/60" -120 sec). This forces the air out of the chamber. At the end of the preset time, S2 (Fast Exhaust) and S6 (Vacuum Water) are turned off.

Alarms: Code 75 - Cycle does not start correctly

Pressure Pulse (1)

S1 (Steam to Chamber) remains open. S5 (Slow Exhaust) opens allowing cooling water to condense the steam from the chamber. The setpoint of the pressure pulse is directly related to the cycle exposure setpoint and varies from cycle to cycle. Once the setpoint is made, the cycle advances to the Vacuum Pulse phase.

Alarms: Code 04 - Too long to attain setpoint (5 min) during a Pressure Pulse

Vacuum Pulse (1)

S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on exhausting the chamber until the setpoint of 9.6 PSIA is reached. S2 (Fast Exhaust) and S6 (Vacuum Water) are then turned off.

Alarms: Code 02 - Too long to pull a vacuum

Pressure Pulse (2)

S1 (Steam to Chamber) turns on. S5 (Slow Exhaust) opens allowing cooling water to condense the steam from the chamber. The setpoint of the pressure pulse is directly related to the cycle exposure setpoint and varies from cycle to cycle. Once the setpoint is made, the cycle advances to the Vacuum Pulse phase.

Alarms: Code 04 - Too long to attain setpoint (5 min) during a Pressure Pulse

Vacuum Pulse (2)

S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on exhausting the chamber until the setpoint of 4.8 PSIA is reached. S2 (Fast Exhaust) and S6 (Vacuum Water) are then turned off.

Alarms: Code 02 - Too long to pull a vacuum

Pressure Pulse (3)

S1 (Steam to Chamber) turns on. S5 (Slow Exhaust) opens allowing cooling water to condense the steam from the chamber. The setpoint of the pressure pulse is directly related to the cycle exposure setpoint and varies from cycle to cycle. Once the setpoint is made, the cycle advances to the Vacuum Pulse phase.

Alarms: Code 04 - Too long to attain setpoint (5 min) during a Pressure Pulse

Vacuum Pulse (3)

S1 (Steam to Chamber) and S5 (Slow Exhaust) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on exhausting the chamber until the setpoint of 4.8 PSIA is reached. S2 (Fast Exhaust) and S6 (Vacuum Water) are then turned off.

Alarms: Code 02 - Too long to pull a vacuum

Charge

After Condition is complete, S1 (Steam to Chamber) and S5 (Slow Exhaust) are tuned on. The chamber is charged with steam until the selected setpoint is attained.

Alarms: Code 06 -Too long to achieve exposure setpoint during the Charge Phase.

Exposure

When exposure temperature setpoint is attained, S1 (Steam to Chamber) turns off. The S1 valve turns on and off maintaining the setpoint (131°C) within a temperature window. If the unit is equipped with a S7 (Multitherm Steam) and a S4 (Multitherm Bypass), these 2 valves turn off and on with the S1 to maintain the correct exposure temperature. Exposure time for the Leak Test is 3 minutes

Alarms: Code 10 Undertemp

Code 14 Overtemp

Code 47 - Chamber Pressure value incorrect

Exhaust

At the end of the exposure time, S1 (Steam to Chamber). S5 (Slow Exhaust). S4 (Multitherm Bypass) and S7 (Multitherm Steam) are turned off. S2 (Fast Exhaust) and S6 (Vacuum Water) are turned on. The chamber is evacuated to below atmospheric pressure.

Alarms: Code 02 - Too long to pull a vacuum

Code 16 -Too long to exhaust

Dry

Both S2 (Fast Exhaust) and S6 (Vacuum Water) remain on during the entire Dry time selected. Dry time for the Leak Test is 15 minutes.

Dwell

When the Dry time is complete, the cycle sw a dwell time of 5 minutes. All valves, except for S8 (Steam to Jacket), are turned off.

Leak Test

At the end of the Dwell time, the Leak Test begins. The controll monitors the chamber for 15 minutes. Maximum leak rate is 1 mm/1 minute.

Vent

S2 (Fast Exhaust) and S6 (Vacuum Water) turn off and the completion of the Dry time. S3 (Filtered Air) turns on and vents the chamber back up to atmospheric pressure.

Alarm: Code 20 - Chamber above or below atmospheric at end of cycle

Complete

Buzzer will turn on and S2 (Fast Exhaust) and S3 (Filtered Air) Turn on.

SECTION 4 . . , Error Codes

CASTLEERRORCODES			
CODE	DESCRIPTION	POSSIBLE CAUSE	CORRECTIVE ACTION
02	Time limit exceeded to pull a vacuum in the Condition Phase of the cycle. 36" unit is 5min. 48" & 60' unit is 12 mins.	No water pressure Water pressure below minimum requirements Leak around door gasket Strainers plugged S1 or S3 not closed S2 or S6 not opened No cycle selected before cycle start pressed. Water ejector failure	<ul style="list-style-type: none">• verify correct water pressure and flow.• Replace door gasket• Check and clean water supply and chamber drain strainers• Relace or repair solenoids• replace or repair solenoids• Select a cycle before pressing cycle start• Check ejector for proper operation
04	Time required to attain the set point of the pressure pulse during the Condition phase was exceeded (5 minutes).	Cycle exposure set point incorrect Low or no steam pressure Steam to Chamber valve (S1) failed Fast Exhaust valve (S2) failed Steam to Jacket valve (SS) failed Steam strainer plugged Chamber steam trap failed Door switch failure or adjustment wrong	<ul style="list-style-type: none">• Set proper exposure temperature for cycle.• Check steam pressure for required pressure and flow.• Repair or replace• Repair or replace• Repair or replace• Clean• Repair or replace element• Adjust correctly or replace if defective.
06	Too long to achieve exposure set point during Charge Phase. 3622 Wrapped Unwrapped Liquids 36" 4m 9m 30m 48" 6m 6m 40m 60" 6m 6m 40m 3633 36" 5m 9m 20m 48" 6m 6m 40m 60" 6m 6m 40m Multi-therm 36" 90m 48" 120m 60" 120m	Low or no steam pressure Cycle set exposure temperature incorrect Steam to Chamber valve (S1) failed Steam to Jacket valve (S8) failed Steam strainer plugged Steam traps failure Door switch failure or adjustment wrong.	<ul style="list-style-type: none">• Check steam supply for proper pressure and flow• Set proper exposure temperature for cycle.• Repair or replace-Repair or replace• Clean• Repair or replace element.• Adjust correctly or replace if defective.
08	Unit does not charge to set-point within a certain time period	Low gas supply Charge valves failed	<ul style="list-style-type: none">• Check gas tanks• Repair or replace

CODE	DESCRIPTION	POSSIBLE CAUSE	CORRECTIVE ACTION
10	Undertemp condition during the Exposure phase of the cycle 1 degree C below setpoint	Low or no steam pressure Chamber drain strainer plugged Steam to Chamber valve (S1) failed Steam to Jacket valve (S8) failed Fast Exhaust valve (S2) failed Multi-thermo Steam valve (S7) failed	<ul style="list-style-type: none"> Check steam for correct pressure and flow rate. Clean Repair or replace -Repair or replace Repair or replace Repair or replace
12	6900 Washers only Wash water temperature to low	Low or no steam pressure Steam to Chamber valve S1 failed Steam to Sump valve S15 failed	<ul style="list-style-type: none"> Check steam supply for proper pressure and flow Repair or replace -Repair or replace
14	Overtemp during the Exposure Phase 6 degrees C above setpoint	set point for exposure temperature incorrect Steam to Chamber (S1) valve failed Steam to Jacket (S8) valve failed	<ul style="list-style-type: none"> set proper temperature for cycle Repair or replace -Repair or replace
16	Too long in exhaust. The time to exhaust the chamber exceeded the following limits. 16" 5 min 20" 8 min 36" 12 min 48" 15 min 60" 15 min	Chamber strainer plugged Steam to Chamber (S1) valve leaking Fast Exhaust valve (S2) failure Door gasket leaking	<ul style="list-style-type: none"> Clean Repair or replace Repair or replace Clean or replace
18	Too long in air break The time limit fro chamber to reach atmospheric pressure was exceeded. 16" 20" xx22 xx33 36" 2 min 2 min 48" 2 min 3.5 min 60" 2 min 3.5 min Multi-therm 36" 2 min 48" 3 min 60" 3 min	Air filter plugged Filter Air valve (S3) failure	<ul style="list-style-type: none"> Replace filter Repair or replace

CODE	DESCRIPTION	POSSIBLE CAUSE	CORRECTIVE ACTION
20	At the end of the cycle a pressure of 2 psi above or below atmospheric remains in the chamber	Steam to Chamber valve (S1) failure Fast Exhaust valve (S2) failure Vacuum Water valve (S6) failure Chamber bleed valve plugged	<ul style="list-style-type: none"> ▪ Repair or replace ▪ Repair or replace -Repair or replace ▪ Clean
22	The unit is running a Vacuum Leak Test	None	▪ None
24	Power door failure. Door is jammed or switch has failed	The door is obstructed Door switch has failed or out of adjustment	<ul style="list-style-type: none"> ▪ Clear obstruction from door ▪ Adjust door switches -Replace door witch.
40	Air Flow alarm Loss of facility exhaust system	Loss of power Failure of the facility's exhaust sytem	<ul style="list-style-type: none"> ▪ Check for power loss ▪ Advise facility of failure

CASTLE ERROR CODES			
CODE	DESCRIPTION	POSSIBLE CAUSE	CORRECTIVE ACTION
41	A loss of gas pressure or an insufficeint amount of gas. More than 3 makeups in 1 hour.	Low tank pressure Door gasket leak	<ul style="list-style-type: none"> • Check gas supply • Clean or replace door gasket
43	Insufficeint wash water pressure Chamber water pressure is less than 5 psi	Low water pressure SSR4 failed Circulation pump failed	<ul style="list-style-type: none"> -Check for proper water pressure • Check for output of SSR4 replace if necessary • Check circulation for proper operation
45	Gas overpressure , gas pressure in chamber is greater than setpoint + 6psi	Gas Charge valves (S41 , S42) failed open SSR 17 faile closed	<ul style="list-style-type: none"> • Repair or replace -Replace
47	Chamber Pressure value incorrect	Pressure requires calibration Pressure Transducer failed Control Board Failure	<ul style="list-style-type: none"> • Calibrate pressure transducer • Replace transducer -Replace control board
49	Chamber overtemp temperature of chamber exceeds 48 degrees C (38 degree cycle) or 63 degrees C (55 degree cycle)	Calibration Failure Jacket Water valve S8 failure	<ul style="list-style-type: none"> • Check calibrtration • Repair or replace
53	Insufficeint water fill in the chamber after 4 minute wait. Chamber pressure has not reached 2 psi.	Low or no water pressure Vent valve (S 16) failure Spray Water valve (S 13) failure SSR 14 or SSR15 failure	<ul style="list-style-type: none"> • Check water pressure for correct pressure and flow -Repair or replace • Repair or replace • Relace
55	Gas cycle undertemp , temperature is less than 5 degrees below set point	Lass of water supply Jacket Heat valve S8 failure Jacket Water Fill valve S18 failure Jacket Pump failure Jacket RTD failure	<ul style="list-style-type: none"> • Check water supply for proper pressure and flow • Repair or replace • Repair or replace • Replace • Calibrate or replace
61	unit will not drain water out of chamber	Loss of water pressure Drain valve S12 failure SSR16 failed Diaphram Valve failure or plugged	<ul style="list-style-type: none"> • Check water pressure for proper pressure and flow • Repair or replace • Replace • Clean or repair
71	Door obstruction on load or unload side	Door system malfuction	

CODE	DESCRIPTION	POSSIBLE CAUSE	CORRECTIVE ACTION
73	Control Board Malfunction	Loss of power to the Control Board Control Board failure Temperature probe failure	<ul style="list-style-type: none"> ▪ Turn off power then turn power back on ▪ Replace Control Board ▪ Recalibrate temperature probes or replace.
75	Cycle does not start correctly	After the cycle was started , the door unsealed	<ul style="list-style-type: none"> ▪ Check the door seal switch, adjust or replace ▪ Check the solid state relays for the door seal activation. SSR6, SSR11 , (SSR7, SSR10 if applicable)
77	Communication Lines Lost of Communiacation	Loss of power Wiring between Control board and Display Board Display Board Failure Control Board Failure Input Solid State Relay failure	<ul style="list-style-type: none"> ▪ Turn off power then turn power back on ▪ Check connections between Control Board and Display Board ▪ Replace ▪ Replace ▪ Replace
79 3633 only	Leak Test rate exceeds 2.7mm/min	Door gasket failure Chamber steam solenoid leaking Filter air valve leaking Chamber drain check valve leaking	-Replace door gasket <ul style="list-style-type: none"> ▪ Rebuild or replace ▪ Rebuild or replace ▪ Replace
81	Power failure or steam pressure to gasket failyre Failure of the Door hook switch	Loss of steam pressure	
83	Low or no airflow from the facility's exhaust air system		

TROUBLESHOOTING CHART

1

Operational status	Trouble Description	Possible Cause or Correction
Unlisted code is displayed	Power to unit interrupted Cables between boards connections Control board failure Display board failure	-Power should be turned off for at least 1 minute than turned back on ▪ Check connections between boards or replace cable if damaged ▪ Replace ▪ Replace
Display is erratic	Power up procedure incorrect Cables between boards connections Control board failure Display board failuure	▪ Use correct procedure -Main circuit breakers first then battery power ▪ Check connections between boards ▪ Replace ▪ Replace
chart on recorder does not advance	No power to recorder motor Recorder moter failure	▪ Check for power at the recorder ▪ Replace
cannot calibrate recorder	Power has just been turned on	▪ Calibration requires that the power to be (for at least 20 minutes
The solenoid valves hum or buzz	Coil is nit seated properly on valve shaft Valve seat is dirty	▪ Install coil on valve correctly ▪ Clean
valve fails to open or closed when energized	No voltage or low voltage to the coil Failed coil supply pressure exceeds rating of the valve	▪ Voltage must be at least 85% of rating Check output of SSR Check incoming power ▪ Replace coil -Match preesure supplied to the rating oft valve

MESSAGAE CENTER • DATA LOGGER TROUBLESHOOT CHART		
Operational status	Trouble Description	Possible Cause or Correction
No response from the Data Logger	Fuse blown Cable connections Main PC board failure	<ul style="list-style-type: none"> • Replace fuse • Check connections • Replace Data Logger
No time display	Cable connections Main PC board failure	<ul style="list-style-type: none"> • Check connections • Replace Data Logger
Data Logger loss of memory	Battery failure 9 volt battery Battery wiring	<ul style="list-style-type: none"> • Replace battery • Check for correct wiring
No Power ON light (green LED) on side of Message Center • Data Logger	Fuse blown (1 amp) No electrical power PC board failure	<ul style="list-style-type: none"> • Replace fuse with correct rated fuse • Check incoming power and circuit breakers • Replace Message Center
No response From message Center (Green LED power light is on	Loss of 24 VAC PC board failure	<ul style="list-style-type: none"> • Check power supply • replace • Check wiring • Check for 24 VAC at transformer, replace transformer if missing • Replace Message Center
No text appears on the Message Center display	Text intensity set too low PC board failure	<ul style="list-style-type: none"> • Adjust intensity control till text is visible • Replace Message Center
Loss of memory after a power interruption	Battery failure (9 VDC)	<ul style="list-style-type: none"> • Replace
Printout faded	Ink ribbon worn	<ul style="list-style-type: none"> • Replace
No printout display ok	Defective printer	<ul style="list-style-type: none"> • Replace Message Center
Printer runs but does not feed paper	Paper is jammed Printer is out of paper	<ul style="list-style-type: none"> • Check printer for correct pathfor paper feed or correct any paper jam • Replace with new roll of paper

POWER DOOR TROUBLESHOOT CHART			1
The LED on the door switch box is on when the door is open	Door Switches are defective	▪ Replace and adjust	
The circuit breaker trips when the door reaches its open position	The stop block is out of position. The door does not open far enough to actuate the stop limit switch	▪ Adjust the stop block and limit switch correctly	
When the door is in motion, the door will not reverse	Motor capacitors are failing	-Replace capacitors	
The door mechanism stalls out when he door closes againgt the floating stop	The gasket requires adjustment of the screws in the hooks	▪ Adjust the screws in the hooks so that the gasket seals. Do not over tighten	
Door will not open. Circuit breaker remains on	The pressure switch is set too low	▪ Adjust switch	
BOOSTER PUMP TROUBLESHOOT CHART			
Booster pump will not run	Fuse failure No input power Bad wire connection Defective pump motor	▪ Replace fuse ▪ Check facility power input ▪ Correct any wire errors or lose wires ▪ Replace	
Booster pump runs but no water pressure	Incorrect voltage Not primed Suction line has an air lock Leak Plugged strainer Defective pump	▪ Check for proper voltage ▪ Reprime ▪ Repipe to remove airlock ▪ Identify leak and repair ▪ Clean or replace ▪ Repair or replace	

SECTION 5 ... CALIBRATION

. . MC2 Calibration

Castle MC II Calibration Temp/ Press

This procedure covers the calibration of the 3500, 3600, 4200 and 6900 series of units.

Tools Required:

RTD Test Box	P-755715-860
Digital Meter	P764321-205
Heise Gauge	P-755715-858

All Castle are calibrated and all cycles are run using Celsius units of temperature. The temperature calibration of the jacket and Chamber is accomplished by a test box containing a fixed set of resistors. Removal or use of the RTD's is not required for calibration.

1.0 Set-up for Chamber and Jacket Calibration.

Refer to Fire #2 for identification of the plug and adjustment potentiometers used for calibration

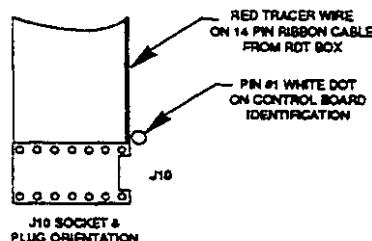


Figure 1

1.1 Turn on the control and allow the control to warm up for at least 5 minutes.

1.2 If Display board is on, turn it off by pressing the Red touch pad (Red pad with white ring and a white dot above the ring). No indicator lights or digital display should be on.

1.3 Raise and latch the blue Display Bezel.

1.4 Loosen the two screws in the upper corners and lower the Control Board Panel.

1.5 Locate J10 on the control board. Insert the 14 pin cable into J10. The orientation of the plug is the red wire must be on the same side and aligned with the white dot and pin #1 of J10.
See Figure #1.

1.6 Remove P9 from the Control Board and insert the J9 connector from the RTD box.

1.7 The digital voltmeter plugs into the RTD box. Observe polarity, black lead into the black socket and the red lead into the red socket. All voltages are positive polarity.

1.8 Set the meter to the 20 VDC scale.

2.0 RTD Calibration of Chamber Temperature.

2.1 Turn the MCI / MCII switch to MCII on the RTD box

2.2 Turn the selector switch on the RTD box to the VR (Voltage reference) position.

2.3 Meter should read 5.00 VDC +/- 0.25 VDC. If the voltage does not fall within this value, the control board will have to be replaced.

2.4 Record the actual Reference Voltage read on the meter. _____

2.5 Turn the rotary switch on the RTD box to the CH (Chamber) position.

2.6 Select the 2 VDC range on the meter.

2.7 Flip the toggle switch on the RTD box to ZERO. Meter should read 0.000 +/- .005 VDC. Adjust the Chamber Temp Zero pot, R90 (refer to Figure #2) until the value on the meter matches voltage value 0.000 +/- .005 VDC.

NOTE: Adjustments of the Zero and Span pots are very sensitive. It's absolutely necessary that the voltage fall within the stated requirement. Take the time to do it accurately.

2.8 Flip the toggle switch on the RTD box to SPAN.

.9 Select the 7.0 VDC range on the voltmeter.

.10 Adjust the Chamber Span Pot, R91 (refer to Figure #2), until the voltage reads the Reference Voltage recorded in step 2.4 plus $+.040 - .000$ VDC

NOTE: The Zero and Span pots interact on each other. Its necessary to repeat steps 2.6 through 2.10 until the desired readings are correct. The FINAL adjustment should always be made on the ZERO pot.

.O RTD Calibration of the Jacket Temperature.

.1 Turn the rotary switch on the RTD box to the JA (Jacket) position.

.2 Select the 2 VDC range on the meter.

.3 Flip the toggle switch on the RTD box to ZERO. Meter should read $0.000 \pm .005$ VDC. Adjust the Jacket Temp Zero pot, R40 (refer to figure #2) until the value on the meter matches voltage value $0.000 \pm .005$ VDC.

NOTE: Adjustments of the Zero and Span pots are very sensitive. It's absolutely necessary that the voltage fall within the stated requirement. Take the time to do it accurately.

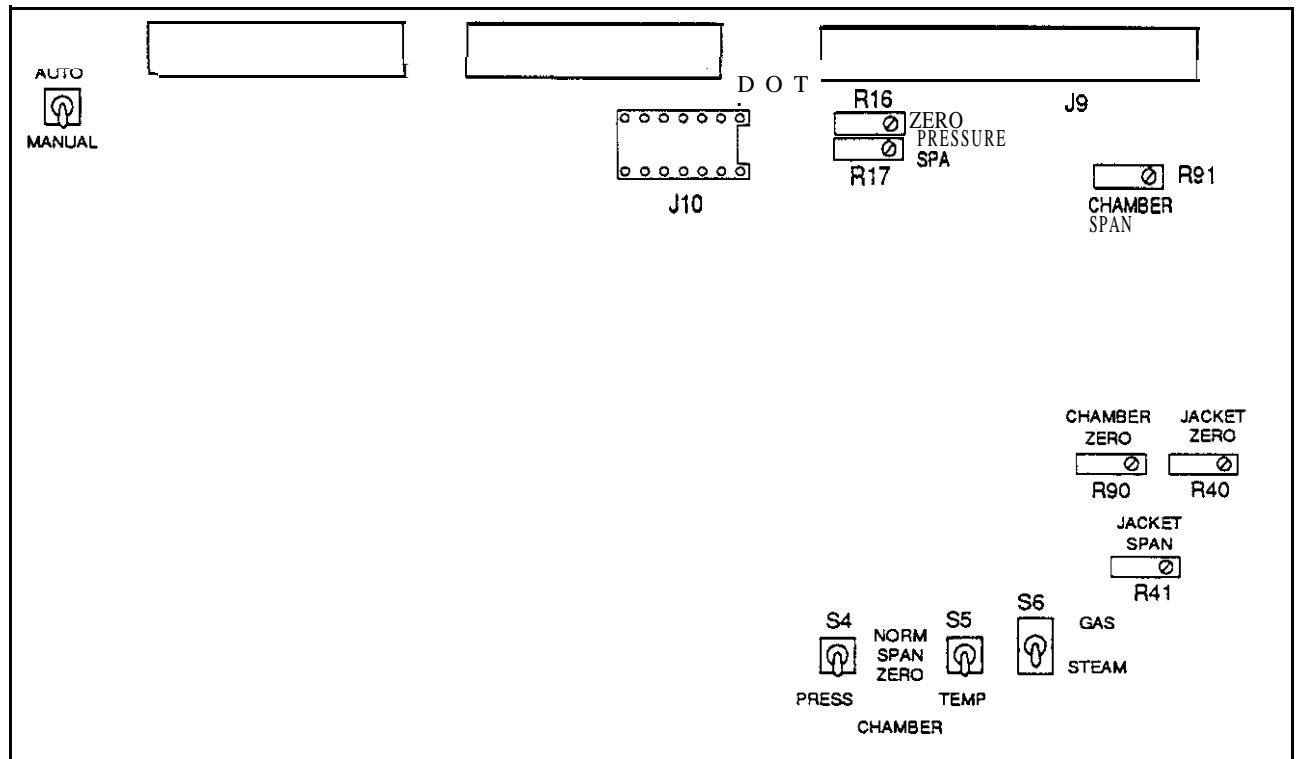


Figure 2

.4 Flip the toggle switch on the RTD box to SPAN.

.5 Select the 20 VDC range on the voltmeter.

.6 Adjust the Jacket Span Pot, R41 (refer to Figure #2), until the voltage reads the Reference Voltage recorded in step 2.4 plus $+.040 - 0.000$ VDC

NOTE: The Zero and Span pots interact on each other. Its necessary to repeat steps 2.6 through 2.10 until the desired readings are correct. The FINAL adjustment should always be made on the ZERO pot.

.7 When calibration of both probes is complete, remove the test box cable from J9 and replace the original J9 connector removed in step .6.

Pressure Calibration

1.0 Set-up for Calibration of Pressure

NOTE: All pressure units are in PSIA.

1.1 Make sure there is no pressure in the chamber and the door is open.

1.2 Remove the 1/4 inch flue fitting from Transducer line protruding from the front panel

1.3 Connect a 36 inch piece of 1/4 inch copper tubing between the transducer line and a Heise gauge. Make sure that the tubing is coiled about three turns.

1.4 Remove the RTD box cable from J9 and plug in the J9 from the unit into the control board. Turn the selector switch on the RTD box to FR.

1.5 Select the PSIA units on the Heise gauge and set the voltmeter so that it reads 10% of what is indicated on the Heise gauge.
Example 45 PSIA = 4.50 VDC

1.6 Close the chamber bleed valve. This will stabilize the pressure in the chamber. Count the number of turns when closing it so it can be opened to the same setting after the pressure calibration is complete.

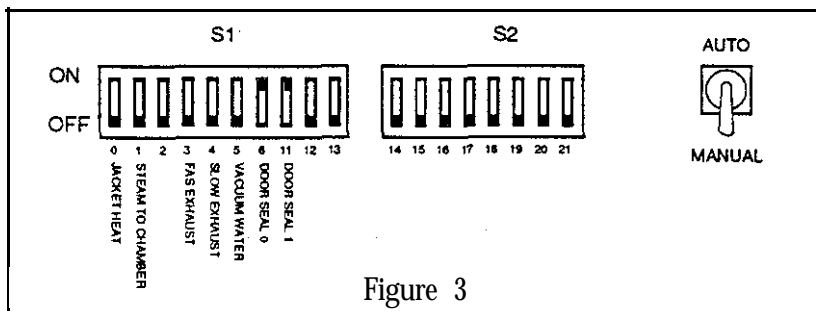
1.7 Close the door

1.8 Switch the manual control switch to manual. It is located next to the dip switches on the control board. See Figure #3.

4.9 Turn ON the following dip switches:

Medium: dip 6 (door 0 direction)
dip 11 (door 1 direction)
dip 12 (power to door 0)
dip 13 (power to door 1)

Small: dip 6 (seal door 0)
dip 11 (seal door 1)



4.10

NOTE: When the control is in the manual mode, all automatic limit controls of the steam pressure in the jacket and chamber are disconnected. The pressure in the jacket and chamber must be monitored during calibration and is controlled by the turning the appropriate dip switches on or off.

NOTE: Turn on the jacket steam and the chamber steam valve ON at the same time.

NOTE: During the following procedure the chamber pressure will be changing at a rapid rate. When adjusting the SPAN pot, cover the last digit display with a piece of tape. This display changes so rapidly that it is a distraction.

Turn ON the following dip switches to charge the chamber with steam.

dip 0 (Steam to Jacket)
dip 1 (Steam to Chamber)

4.11 Allow the chamber pressure to climb to 45 PSIA before turning off the dip switches. Adjust the Pressure Span Pot (R17) so that the voltmeter reads 10% of the reading of the Heise gauge. It is important that the Span pot voltage tracks the pressure in the chamber. If necessary, increase the pressure in the chamber by turning the steam valves back on.

4.12 Turn OFF the steam valves and turn on the following dip switches:

dip 3 (Fast Exhaust)
dip 4 (Vacuum Water)

Exhaust the chamber to 5 PSIA if unit is a prevacuum unit or to atmosphere pressure, if unit is a gravity.

4.13 Adjust the Chamber Zero pot (R16) so that the voltmeter reads 10% of the reading on the Heise gauge +/- 0.005 VDC.

4.14 Repeat steps 4.11 thru until the settings are correct.

NOTE: Always make the final adjustment on the Zero pot.

4.15 Bring the chamber to atmospheric pressure, reset the dip switches leaving numbers 6, 11, 12, 13 on. Place the Auto/Manual switch in the Auto position. Disconnect all test equipment. Return unit to normal operating condition.

4.16 Unseal door, wait 30 seconds

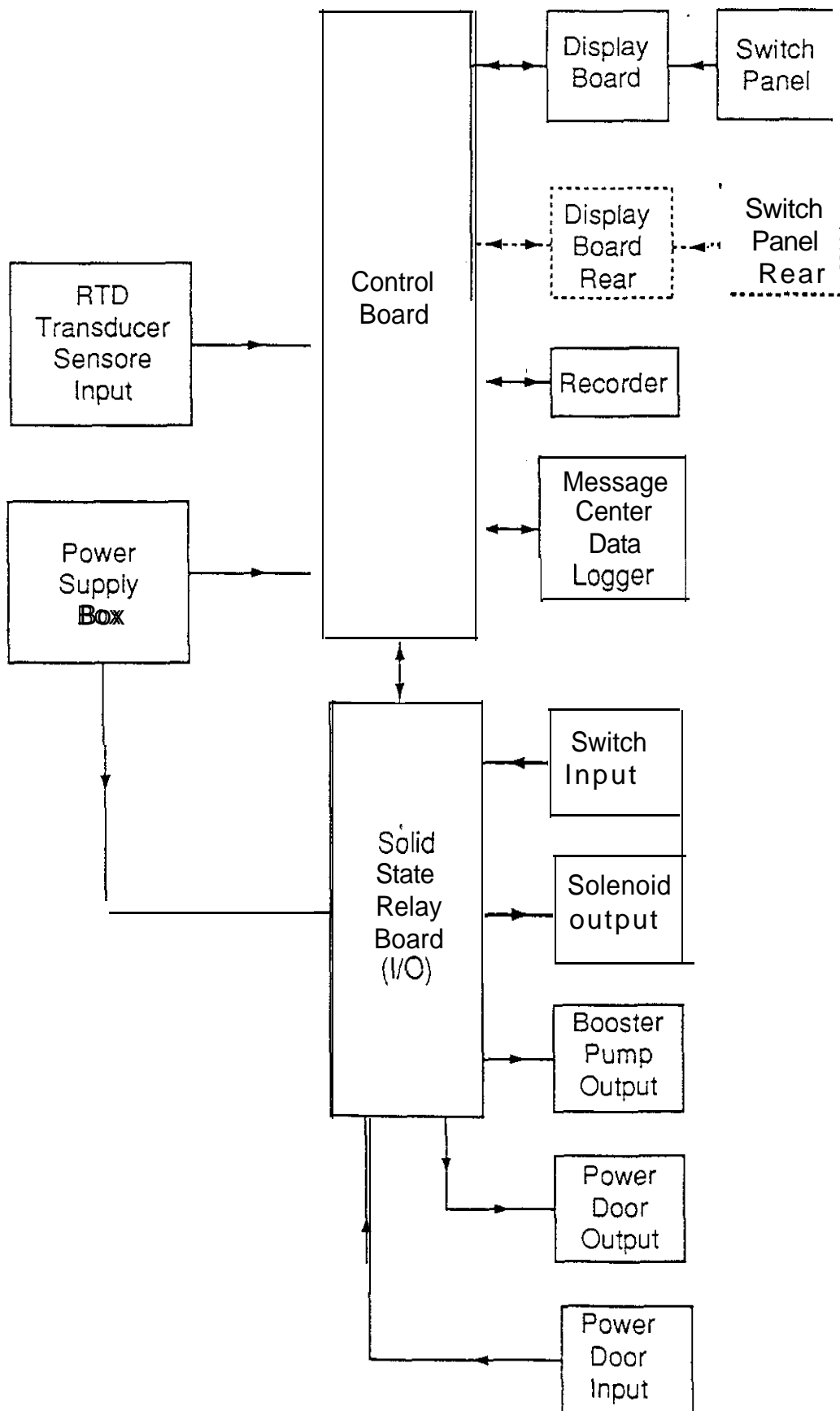
4.17 Power the unit off then on. Seal the door(s). Unseal the door or the Load door. Open the door.

4.18 Run Cycle to check for proper operation.

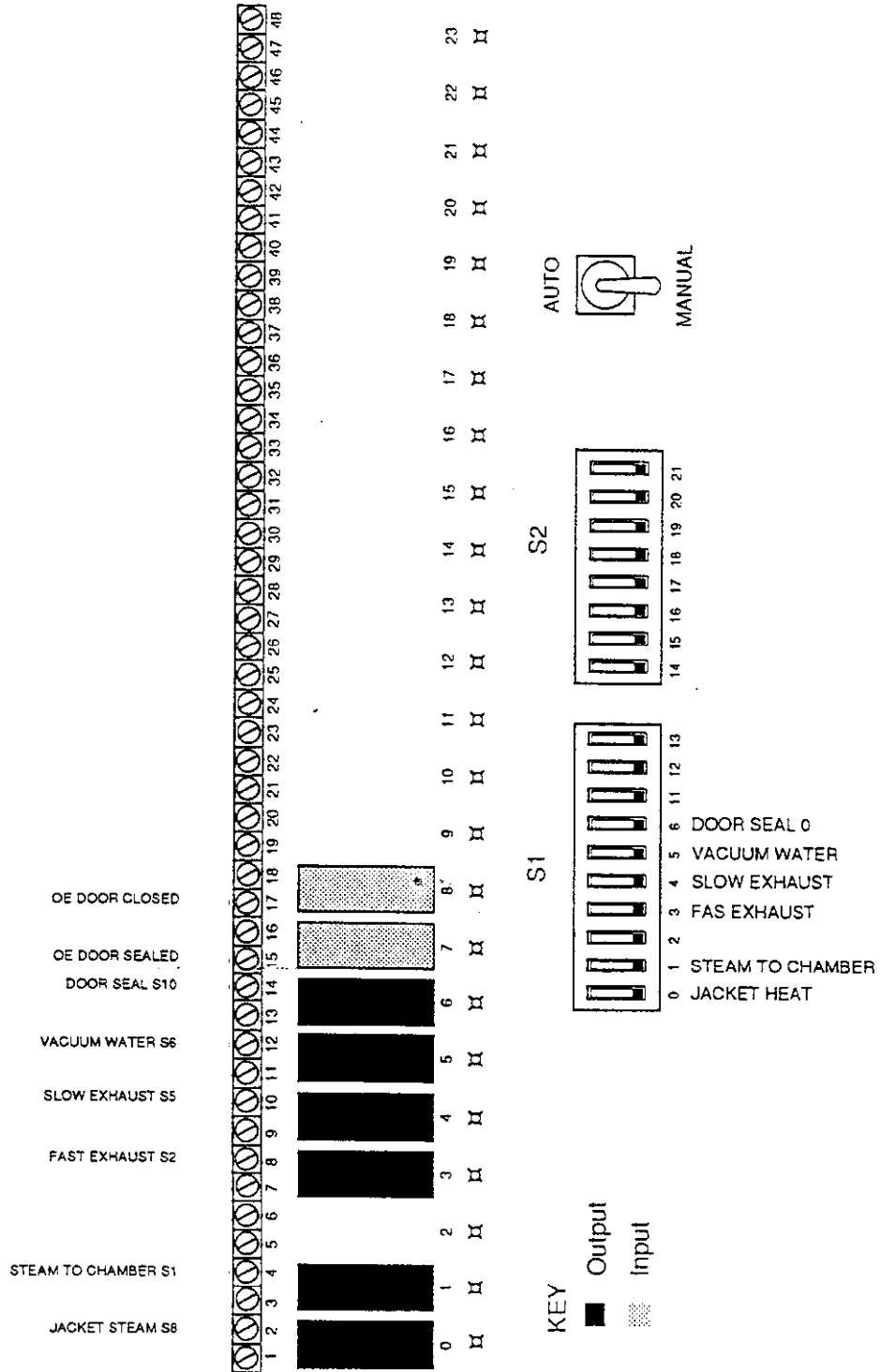
SECTION 6. . . ELECTRICAL SCHEMATICS

- . . MC2 Control**
 - . Control Block Diagram**
 - . Relay Configuration**
 - 3522 Single Door**
 - 3522 Double Door**
 - 3525 Double Door**
 - 3533 Single Door**
 - 3533 Double Door**
 - 3622 Single Door**
 - 3622 Double Door**
 - 3633 Single Door**
 - 3633 Double Door**
 - . Jumper Configuration MC2 and Display**
 - 3522**
 - 3523**
 - 3533**
 - 3571**
 - 3622**
 - 3623/3633**
 - 3671**

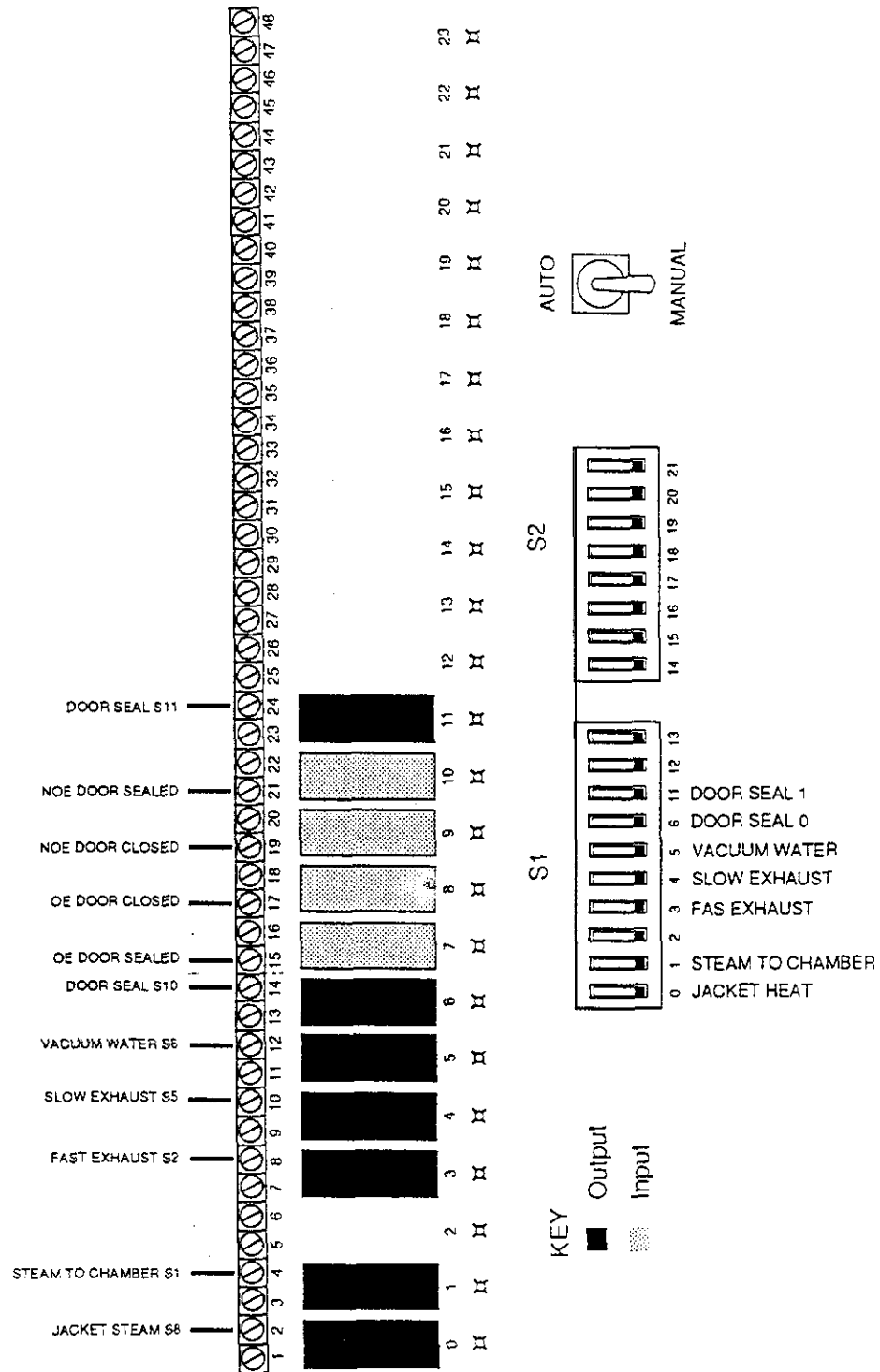
MC II Control Block Diagram



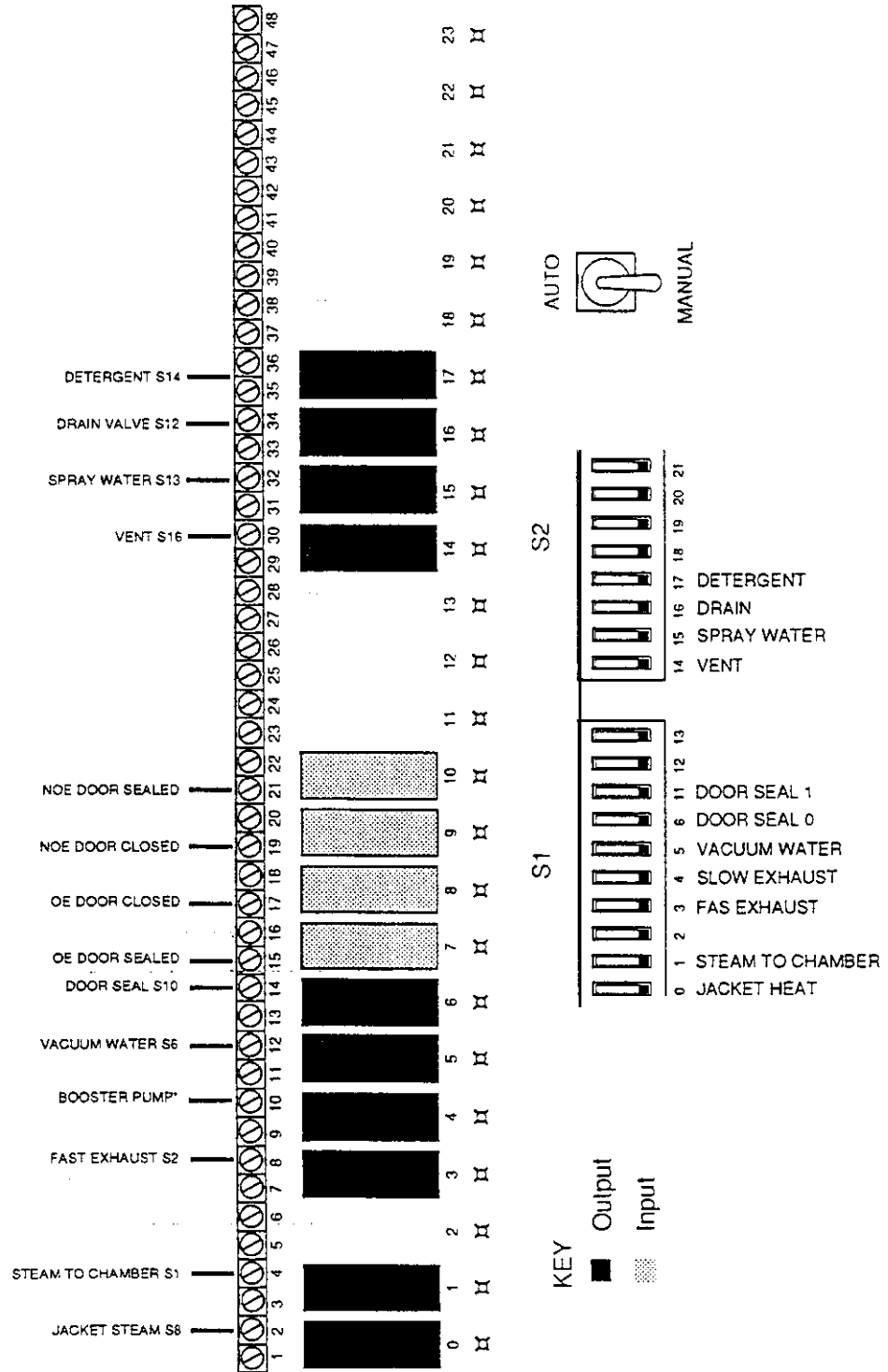
3522 SINGLE DOOR

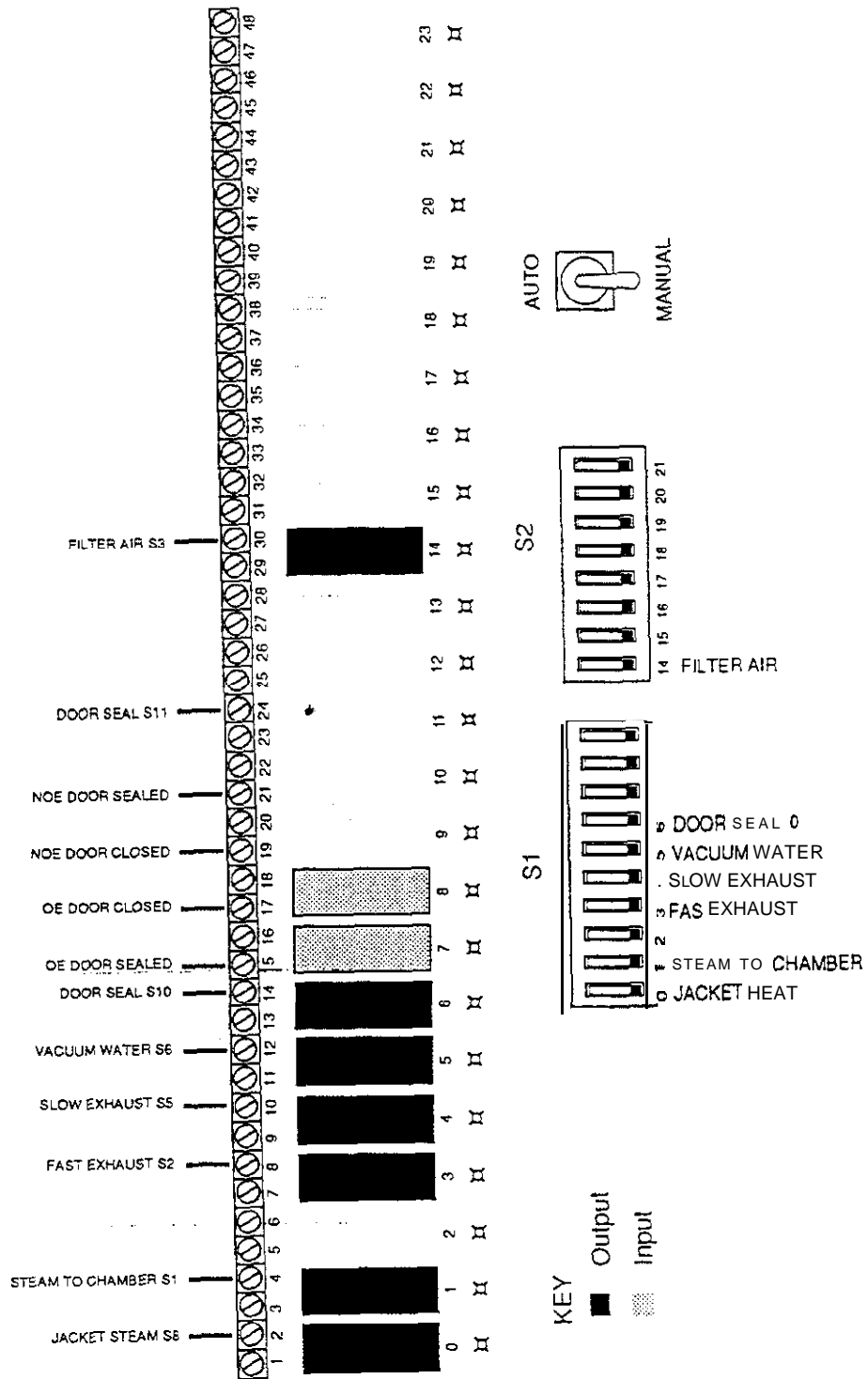


3522 DOUBLE DOOR

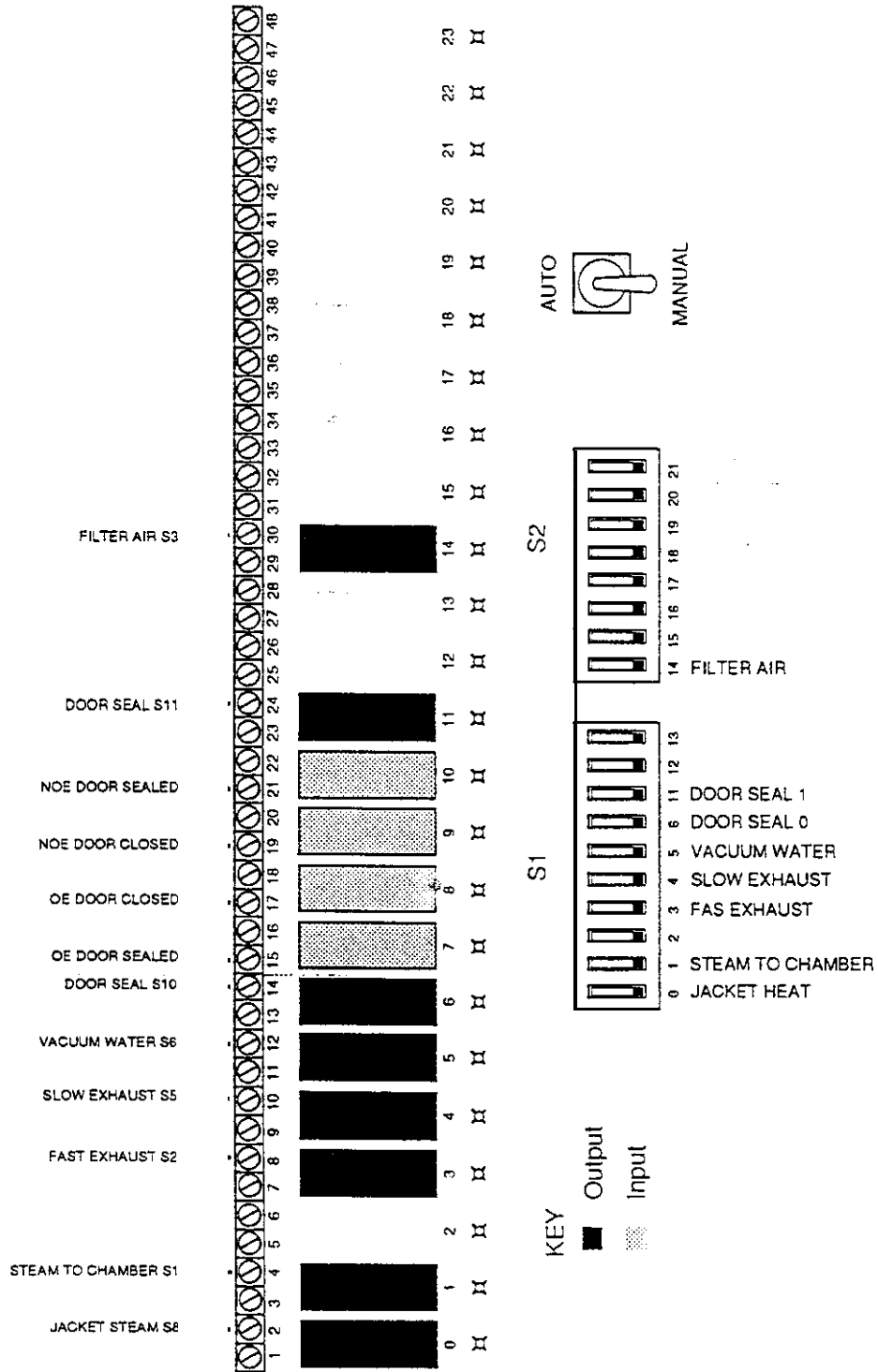


3525 DOUBLE DOOR

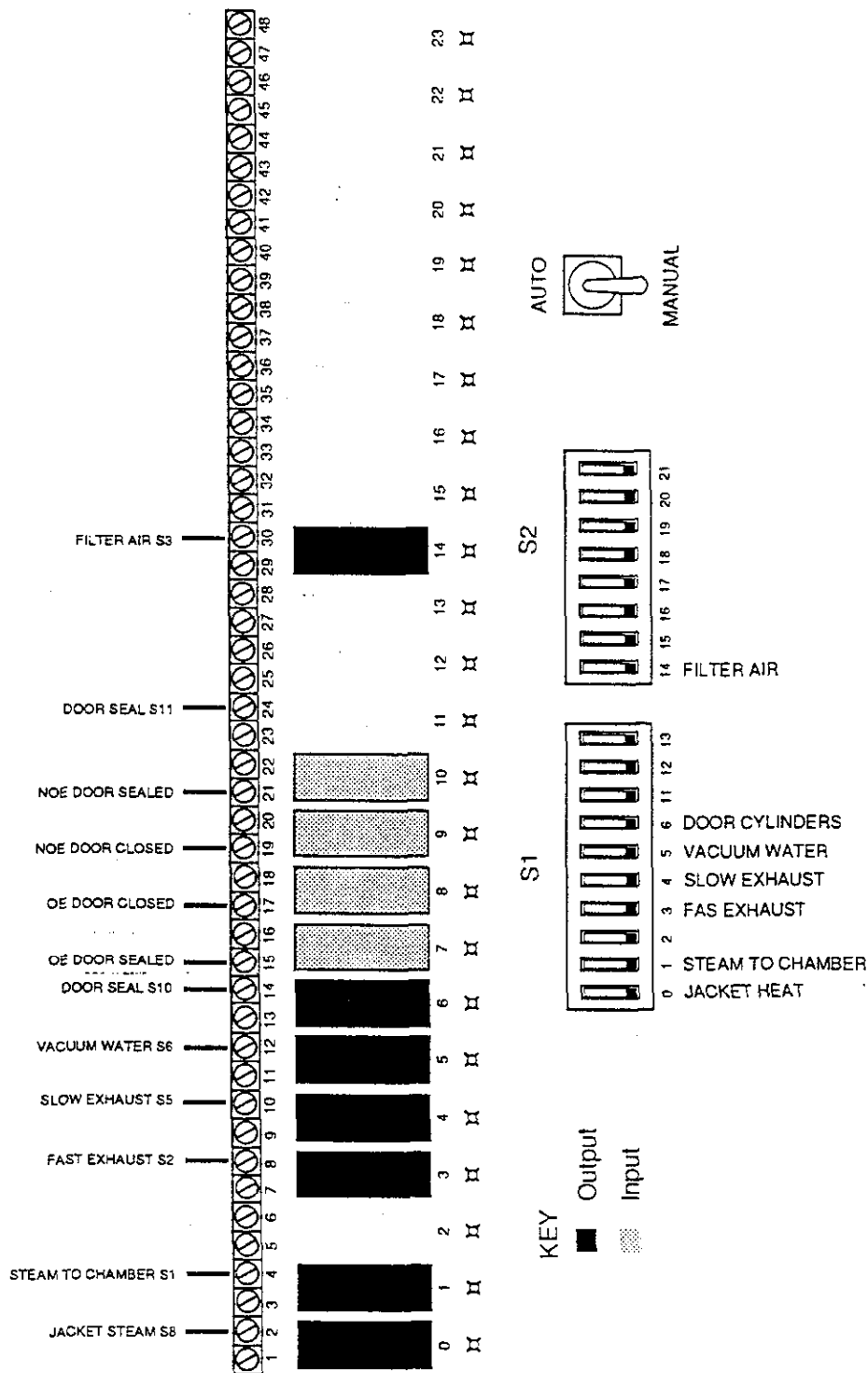




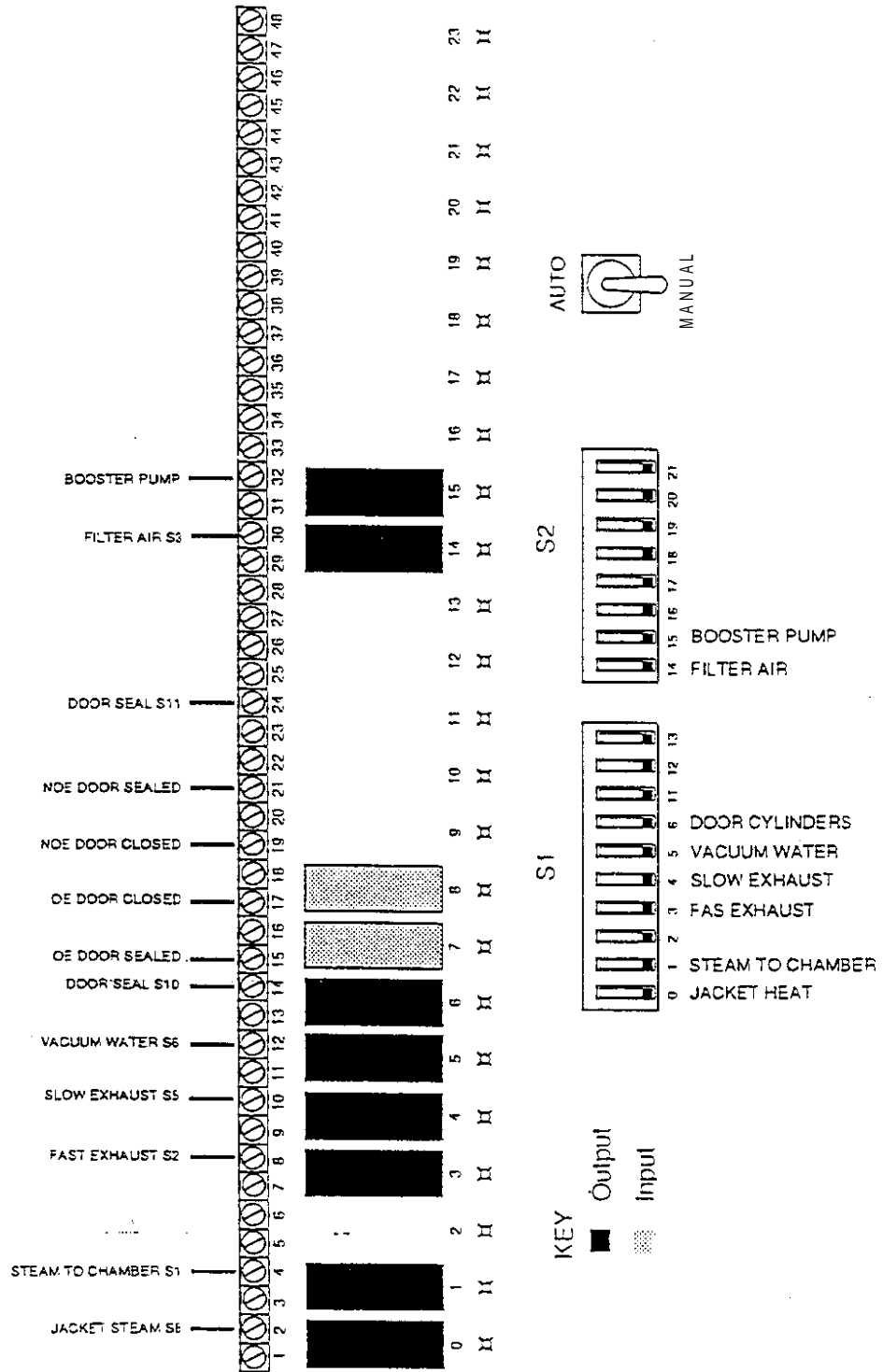
3533 DOUBLE DOOR



3622 DOUBLE DOOR



3633 SINGLE DOOR



JUMPER CONFIGURATION for MCII CONTROL and DISPLAY

Control Board (CB)

- DD • ~~confi~~gures unit as a single or double door
 - no jumper = single door unit
 - jumper = double door
- UN • allows either door to opened at the end of the cycle or allows only one door open after a cycle
 - no jumper = both doors can be opened
 - jumper = only one door can be opened
- VAC • Determines if the unit is a gravity or prevac unit.
 - no jumper = gravity unit
 - jumper = vacuum unit
- PWR • Selects power door or manual door.
 - no jumper = manual door
 - jumper = power door
- LSB • determines chamber size
 - no jumper = 16" chamber
 - jumper = 20" chamber
- MSB • determines chamber size
 - no jumper = 36" chamber
 - jumper = 48" chamber
- UN • selects unit as AMPS/3600 manual door
 - no jumper = standard unit configuration
 - jumper = AMPS unloader or 3600 manual door
- ALT high altitude selection
 - no jumper = low altitude
 - jumper = high altitude

Display Board (DB#)

- STM • ~~selects~~ either steam or gas
 - no jumper = gas
 - jumper = steam
- IWS • selects steam or instrument washer sterilizer
 - no jumper = steam unit
 - jumper = IWS unit
- AMP • selects AMPS or steam unit
 - no jumper = steam unit
 - jumper = AMPS unit
- OPT selects ~~multitherm option~~/ auto AMPS
 - no jumper = ~~multitherm~~ /auto APMS
 - jumper = standard steam
- PWR • ~~selects~~ power door or manual door
 - no jumper = manual door
 - jumper = power door
- DR1 • display address 0 or 1
 - no jumper = display and door OE. (0)
 - jumper = display and door N.O.E. (1)
- RMT • main door or remote door
 - no jumper = main door
 - jumper = remote door
- TMP • pressure rating of the chamber
 - no jumper = 35# vessel
 - jumper = 40# vessel

JUMPER CONFIGURATION FOR MC2 CONTROL

3522

16 X 16 SINGLE DOOR

20 X 20 SINGLE DOOR

16 X 16 DOUBLE DOOR

20 X 20 DOUBLE DOOR

20 X 20 UNIDIRECTIONAL

CB - Control Board

DD - Double Door	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
UN - Amps Unloaded	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VAC - Vacumatic	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
PWR - Power Door	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
LSB - Chamber Size 16"	..	<input checked="" type="checkbox"/>	..	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
MSB - Chamber Size 20"	..	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
UNI - Unidirectional	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ALT - Altitude Option	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

DB 0 ■ Display Board 0 (OE)

STM ▪ Steam							
IWS -Washer Sterilizer	...	...	...	...	...	...	...
AMP ▪ Amps Select	...	...	...	...	...	...	...
OPT ▪ Multitherm							
PWR ▪ Power Door	...	...	...	...	...	...	...
DRI - Display Address	...	...	...	...	...	...	...
RMT - Remote Control	...	...	...	...	...	...	...
TMP - Chamber pressure	...	...	...	...	...	...	...

DB 1 - Display Board 1 (NOE)

STM - Steam						
IWS - Instrument Washer				..	..	..
AMP - Amps Select				..	..	..
OPT - Multitherm						
PWR - Power Door				..	..	..
DRI - Display Address				..	..
RMT - Remote Control				..	..	..
TMP - Chamber Pressure				..	..	..

JUMPER CONFIGURATION FOR MC2 CONTROL

3523

16 X 16 SINGLE DOOR

20 X 20 SINGLE DOOR

16 X 16 DOUBLE DOOR

20 X 20 DOUBLE DOOR

20 X 20 UNIDIRECTIONAL

CB - Control Board

DD - Double Door	..	..	■	■	■	■
UN - Amps Unloaded	..	..	..	..	..	..
VAC - Vacumatic	..	..	..	..	..	..
PWR - Power Door	..	..	..	..	..	..
LSB - Chamber Size 16"	..	■	..	■	■	■
MSB - Chamber Size 20"	..	..	..	..	..	..
UNI - Unidirectional	..	..	..	..	..	..
ALT - Altitude Option	..	..	..	..	..	..

DB 0 - Display Board 0 (OE)

STM - Steam	■	■	■	■	■	■
IWS - Washer Sterilizer	..	..	..	..	..	..
AMP - Amps Select	..	..	..	..	..	..
OPT - Multitherm	..	..	..	..	..	..
PWR - Power Door	..	..	..	..	..	..
DRI - Display Address	..	..	..	..	..	..
RMT - Remote Control	..	..	..	..	..	..
TMP - Chamber Pressure	..	..	..	..	..	..

DB 1 - Display Board 1 (NOE)

STM - Steam	■	■	■	■	■	■
IWS - Instrument Washer	■	■	■	■	■	■
AMP - Amps Select	■	■	■	■	■	■
OPT - Multitherm	■	■	■	■	■	■
PWR - Power Door	■	■	■	■	■	■
DRI - Display Address	■	■	■	■	■	■
RMT - Remote Control	■	■	■	■	■	■
TMP - Chamber Pressure	■	■	■	■	■	■

JUMPER CONFIGURATION FOR MC2 CONTROL

3533

16 X 16 SINGLE DOOR

20 X 20 SINGLE DOOR

16 X 16 DOUBLE DOOR

20 X 20 DOUBLE DOOR

20 X 20 UNIDIRECTIONAL

CB - Control Board

DD - Double Door	..	.	■	■	■	■
UN - Amps Unloaded	..	.	.	.	.	■
VAC - Vacumatic	■	■	■	■	■	■
PWR - Power Door	..	.	.	.	.	.
LSB - Chamber Size 16"	..	■	.	.	■	■
MSB - Chamber Size 20"	..	.	.	.	.	.
UNI - Unidirectional	..	.	.	.	.	.
ALT - Altitude Option	..	.	.	.	.	.

DB 0 - Display Board 0 (OE)

STM - Steam	■	■	■	■	■	■
IWS - Washer Sterilizer	..	.	.	.	.	.
AMP - Amps Select	..	.	.	.	.	.
OPT - Multitherm	■	■	■	■	■	■
PWR - Power Door	..	.	.	.	.	.
DRI - Display Address	..	.	.	.	.	.
RMT - Remote Control	..	.	.	.	.	.
TMP - Chamber Pressure	..	.	.	.	.	.

DB 1 - Display Board 1 (NOE)

STM - Steam	■	■	■	■	■	■
IWS - Instrument Washer	..	.	.	.	.	.
AMP - Amps Select	..	.	.	.	.	.
OPT - Multitherm	■	■	■	■	■	■
PWR - Power Door	..	.	.	.	.	.
DRI - Display Address	..	.	.	.	.	■
RMT - Remote Control	..	.	.	.	.	.
TMP - Chamber Pressure	..	.	.	.	.	.

JUMPER CONFIGURATION FOR MC2 CONTROL

3622

CB - Control Board

DD - Double Door	..	..	■	..	..	■	■
UN - Amps Unloaded	■	■	■	..	..	■	■
VAC - Vacumatic	..	..	..	..	..	..	..
PWR - Power Door	..	..	..	■	■	■	■
LSB - Chamber Size 16"	■	..	..	■	..	..	..
MSB - Chamber Size 20"	..	■	■	..	■	■	■
UNI - Unidirectional	..	..	..	..	..	..	..
ALT - Altitude Option	..	..	..	..	..	..	..

DB 0 ■ Display Board 0 (OE)

STM - Steam								
IWS -Washer Sterilizer	.	.	.	.	.	.	.	.
AMP - Amps Select	..	..	..	..	..	..	..	..
OPT - Multitherm	██	██	██	██	██	██	██	..
PWR - Power Door	..	..	..	..	██	██	██	██
DRI - Display Address	..	..	..	..	..	..	..	..
RMT - Remote Control	..	..	..	..	..	..	..	..
TMP - Chamber Pressure	..	..	..	..	..	..	..	..

DB 1 ■ Display Board 1 (NOE)

STM - Steam							
IWS - Instrument Washer			..			..	..
AMP - Amps Select						..	..
OPT - Multitherm							..
PWR - Power Door			..				
DRI - Display Address							
RMT - Remote Control			..			..	..
TMP - Chamber Pressure			..			..	..

JUMPER CONFIGURATION FOR MC2 CONTROL

3623
3633

CB • Control Board

DD - Double Door	• • • ■ • • • ■ ■ ■
UN - Amps Unloaded	■ ■ ■ ■ • • • • ■ ■
VAC - Vacumatic	• • • • ■ ■ ■ ■ ■ ■
PWR - Power Door	• • • • ■ ■ ■ ■ ■ ■
LSB - Chamber Size 16"	■ • • • • ■ ■ • • • •
MSB - Chamber Size 20"	• ■ ■ ■ • • ■ ■ ■ ■
UNI - Unidirectional	• • • • • • • • • •
ALT - Altitude Option	• • • • • • • • • •
	■ ■ ■ ■ ■ ■ ■ ■ ■ ■

24 X 36 X 36 SINGLE DOOR

24 X 36 X 48 SINGLE DOOR

24 X 36 X 48 DOUBLE DOOR

24 X 36 X 36 SINGLE DOOR POWER DOOR

24 X 36 X 48 SINGLE DOOR POWER DOOR

24 X 36 X 48 DOUBLE DOOR POWER DOOR

24 X 36 X 48 DOUBLE DOOR UNIDIRECTIONAL

DB 0 - Display Board 0 (OE)

STM - Steam	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
IWS - Washer Sterilizer	• • • • • • • • • •
AMP - Amps Select	• • • • • • • • • •
OPT - Multitherm	• • • • • • • • • •
PWR - Power Door	• • • • • ■ ■ ■ ■ ■
DRI - Display Address	• • • • • • • • • •
RMT - Remote Control	• • • • • • • • • •
TMP - Chamber Pressure	• • • • • • • • • •
	■ ■ ■ ■ ■ ■ ■ ■ ■ ■

DB 1 - Display Board 1 (NOE)

STM - Steam	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
IWS - Instrument Washer	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
AMP - Amps Select	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
OPT - Multitherm	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
PWR - Power Door	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
DRI - Display Address	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
RMT - Remote Control	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
TMP - Chamber Pressure	■ ■ ■ ■ ■ ■ ■ ■ ■ ■
	■ ■ ■ ■ ■ ■ ■ ■ ■ ■

JUMPER CONFIGURATION FOR MC2 CONTROL

3671

24 X 36 SINGLE DOOR

24 X 36 DOUBLE DOOR

3571

20 X 20 SINGLE DOOR

20 X 20 DOUBLE DOOR

CB - Control Board

DD - Double Door	..	■
UN - Amps Unloaded	..	..
VAC - Vacamatic	■	■
PWR - Power Door	■	■
LSB - Chamber Size 16"	■	■
MSB - Chamber Size 20"	..	..
UNI - Unidirectional	..	..
ALT - Altitude Option	..	..

..	■
..	..
■	■
..	..
■	■
..	..
..	..
..	..

DB 0 - Display Board 0 (OE)

STM - Steam	..	..
IWS - Washer Sterilizer	..	..
AMP - Amps Select	..	..
OPT - Multitherm	..	..
PWR - Power Door	■	■
DRI - Display Address	■	■
RMT - Remote Control	..	..
TMP - Chamber Pressure	..	..

..	..
..	..
..	..
..	..
■	■
..	..
..	..
..	..

DB 1 - Display Board 1 (NOE)

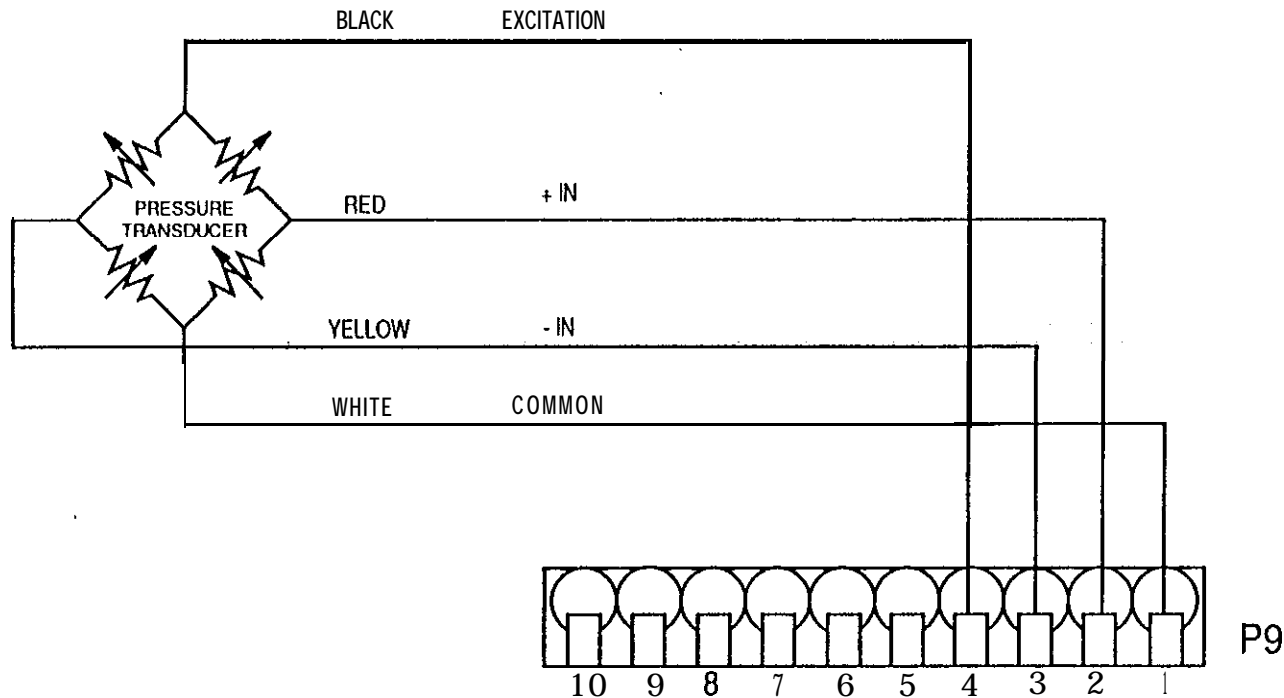
STM - Steam	/	..
IWS - Instrument Washer	/	..
AMP - Amps Select	/	..
OPT - Multitherm	/	■
PWR - Power Door	/	■
DRI - Display Address	/	■
RMT - Remote Control	/	..
TMP - Chamber Pressure	/	..

/	..
/	..
/	..
/	■
/	■
/	■
/	..
/	..

SECTION 7 . . . TROUBLESHOOT PROCEDURES

- .. Foxboro Transducer
- .. RTD Temperture Probe
- .. AC Output Circuit
- .. AC Input Circuit
- .. Power Supply Board

FOXBORO TRANSDUCER



The Foxboro Transducer exhibits a resistance change to a pressure change and is termed a strain type gauge (Wheatstone Bridge). The ratio of voltage versus pressure is 2 microvolts per psia. This model transducer can only be used with an MC2 control and is not interchangeable with the transducer used on the MCI control.

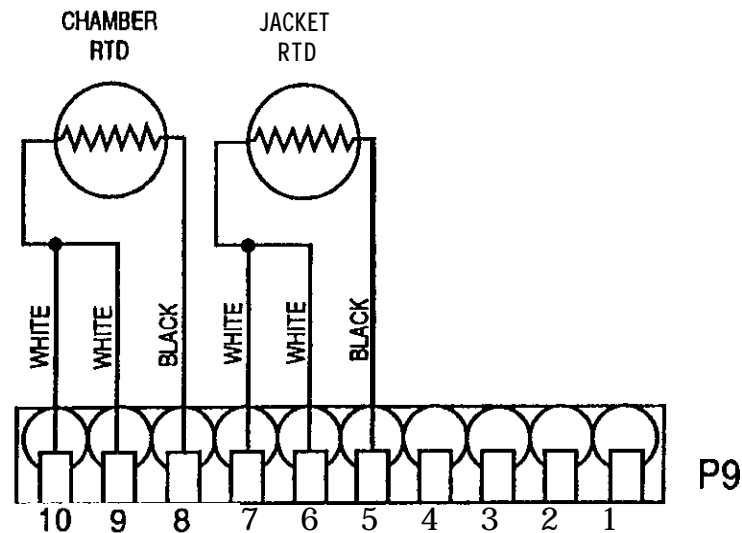
Pressure Range 0 to 50 psia

Output Voltage 0 to 100mv

Troubleshoot and Test of Transducer

- ✓ With power on and the transducer plugged into P9, measure the voltage between P9-1 (common) and P9-4 (excitation). These are the white and black wires from the transducer. Voltage should read 14 VDC. If voltage is missing or low, remove J9 and check for 14VDC at J9 on the control board. If the 14 VDC is still missing, the control is bad or one of the batteries in the battery pack is shorted.
- ✓ Check voltage between P9-3 (- output) yellow and P9-2 (+ output) red. The voltage will be in microvolts. At atmospheric pressure, the output voltage should read close to 28.8 mv. If the voltage measured varies from the range of the transducer, replace the transducer. If output voltage is out of specs by +/- 20%, unit will not calibrate.
- ✓ The RTD tester box can also be used to test the transducer. The output voltage of the transducer will be 10% of the actual pressure displayed on the Heise gauge. When comparing voltage to pressure, be sure the pressure is displayed in psia and not psig. If the transducer does not track correctly, replace the transducer.

RTD TEMPERATURE SENSOR



Temperature is sensed by a resistive temperature probe. The probe has a resistance of $100\ \Omega$ at 0°C , and increases approximately $0.39\ \Omega$ for every degree ($^{\circ}\text{C}$) of temperature increase. The output is fed into the control board and is converted to a voltage corresponding to the temperature. Both the Jacket and the Chamber RTD's are connected through plug P9.

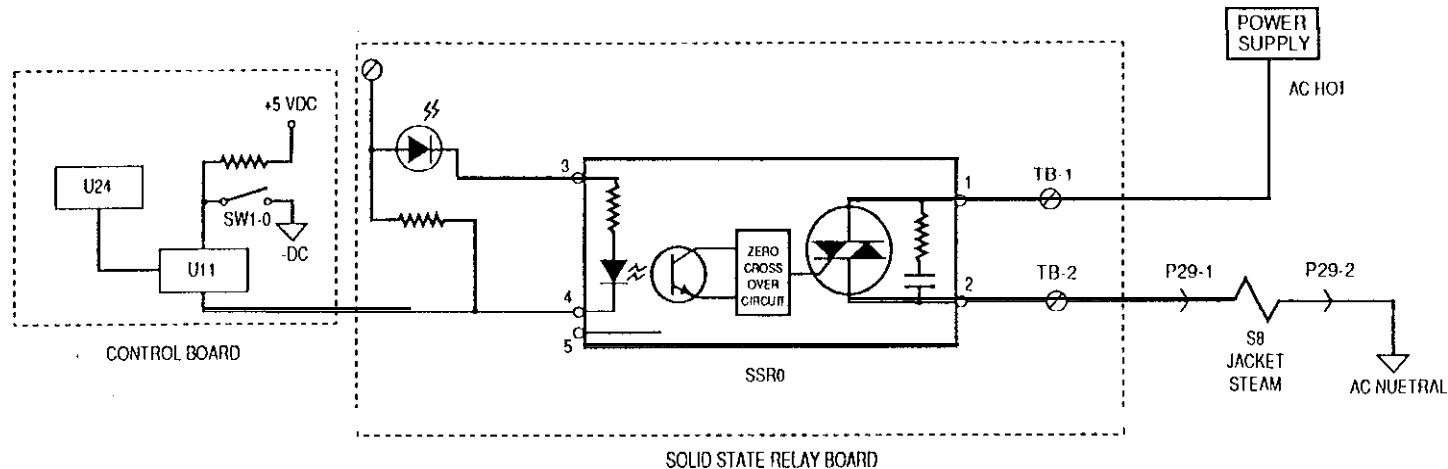
NOTE: Do not calibrate the RTD's using the chamber as a reference. Calibration requires the RTD box and the calibration procedure.

Troubleshoot Procedure

Cycle temperature incorrect

- ✓ Attempt calibration with the RTD box. If temperature channel calibrates correctly, remove probe from unit and measure the resistance between the two leads. If out of spec., replace the RTD.
- ✓ If calibration fails, RTD is OK but the control board is faulty.

AC OUTPUT CIRCUIT



All output devices are driven by Gordos relays mounted on the Solid State Relay Board. The number of relays used depends on what type of sterilizer. All relays are replaceable and are the plug in type. Amsco part # 764326-057. Relays can be actuated by the micro-processor or by a dip switch in the manual mode. A visual indication of the status of the output is provided by a corresponding LED. The LED indicates that the relay has received a signal to actuate. Actual output is available at the long terminal strip at the top of the Solid State Relay Board. Relays that are the color BLACK are AC Voltage (120 Volts) output relays only. Relay SSR1 cannot be energized unless the door seal pressure switch (SW1) is energized. This prevents the Steam to Chamber solenoid valve from energizing with the door open.

NOTE: All solid state relays have electrical leakage. If the solid relay does not have a load across its output, the output voltage can still be present causing the misconception that the relay is shorted on. Always read the output voltage of the relay with a load connected (solenoid valve) using neutral as the reference.

Troubleshoot Procedure

Solenoid does not actuate

- ✓ LED for that solenoid should be on. If it is not on, switch to manual control and turn on the corresponding dip switch. If the LED still does not light, replace the control board.
- ✓ If the LED is on, check the output terminal for the output voltage. If voltage is present, check wiring between output relay and the solenoid. Check the connection between the solenoid and AC neutral.
- ✓ If wiring is OK and the LED is on, swap output relays. If this corrects the problem, replace the relay.
- ✓ If no AC voltage is present, check the fuse and circuit breaker.
- ✓ If S1 (Steam to Chamber) valve will not energize, make sure the door or doors are closed and seal and the door pressure switch are functioning correctly.

Solenoid is actuated all the time

- ✓ LED for the solenoid should be off. If LED is on, make the control board is not in the manual mode and the corresponding dip switch is on. If unit is in the auto mode, then the control board is defective, replace.
- ✓ If the LED is off, solid state relay is shorted closed and requires replacement. Make sure the relay did not fail as a result of a shorted coil on the solenoid or from a coil removed from the solenoid

The schematic diagram illustrates the Solid State Relay Board (SSRB) and its connections. The SSRB is a dashed-line enclosure containing a transformer with terminals TB-15 (1) and TB-16 (2). Terminal 1 is connected to a 120 VAC source through a switch. Terminal 2 is connected to AC Neutral. Inside the SSRB, the transformer secondary is connected to a diode bridge rectifier, followed by a 'DRIVE CIRCUIT' block and a relay coil. The relay coil is connected to terminal 3, which is also connected to a 5 VDC power supply (VCC) through a diode and a resistor. Terminal 4 is connected to the same 5 VDC supply through a resistor. Terminal 5 is connected to DC Ground. The SSRB is connected to a CONTROL BOARD (U24) via a J5-33 connector. The CONTROL BOARD is shown as a dashed-line enclosure containing a component labeled U24.

Troubleshoot Procedure

✓ Check if corresponding LED is on. If the LED is not on, apply 120 VAC across the #1 and #2 inputs of the relay. If it still does not light, replace the relay. If the LED does light, Check wiring and operation of the input device.

Input on all the time

✓ If LED is on but no signal to the relay from **the** input device, check for 120 VAC at relay input. If voltage is present, check input device for failure. If voltage is not present, replace **relay**.

Power Supply Board Layout

J5 Control Power

1 Common	7 24 VAC
2 NC	8 24VAC
3 NC	9 24 VAC (optional)
4 +8 VDC	10 24 VAC (optional)
5 +18 VDC	11 Center Tap (optional)
6 -18 VDC	12 +9 VDC (optional)

J4 Data Logger

1 24VAC
2 Center Tap
3 24VAC
4 +18 VDC

J3 Circuit Break

1 +8 VDC to
2 +8 VDCfrom

J2 Battery Input

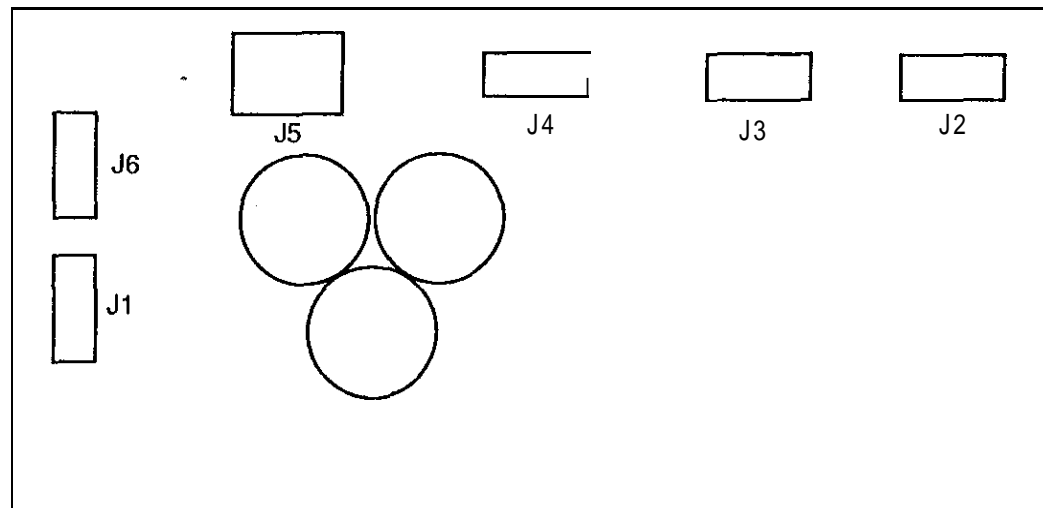
1 Battery
2 Battery+

J6 Code Display

1 24VAC
2 Center Tap
3 24VAC
4 +18 VDC

J1 POWER TRANSFORMER

1 24VAC
2 24 VAC
3 Center Tap
4 Ground



SECTION 8 . . . GENERAL PARTS LIST

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING
TYPE: BALL VALVE

CATTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART NO.
511428	X4328-231	VALVE, BALL 1/4" 600 WOG	CONBRACO/APPOLLO	70-101-01
55116	56401-088	VALVE, BALL 3/8" 600 WOG	CONBRACO/APPOLLO	CH-3/8
58945	764328-230	VALVE, BALL 1/2" 600 WOG	CONBRACO/APPOLLO	70-103-01
39804	56401-096	VALVE, BALL 3/4" 600 WOG	CONBRACO/APPOLLO	70-344-35/45

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING

TYPE: CHECK VALVE

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART NO.
66838	764325-470	VALVE, CHECK 1/4" 400 WOG	CONBRACO	1255
14010	764328-249	VALVE, CHECK 1/4"NPT MALE	CIRCLE SEAL	2262B-2MM
19112 513361 60551	101005-416	VALVE, CHECK 3/8" 400 WOG	CONBRACO	125S
19114 513362 60552	764320-492	VALVE, CHECK 1/2" 200 WOG	CONBRACO	125S
08045 513363 60553 60557	764323-800	VALVE, CHECK 3/4" 400 WOG	CONBRACO	125S
21815 513699 60554 60558	764328-210	VALVE, CHECK 1" 400 WOG	CONBRACO	125S

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING
TYPE: DIAPHRAGM VALVE

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART NO.
37829	764328-239	VALVE, DIAPHRAGM 1"	SINCLAIR COLLINS	C244-4001

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING

TYPE: FILTER

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
511714	764328-242	FILTER, AIR	PURITAN BENNETT	SPU

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING
TYPE: FLOW CONTROL VALVE

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
11929	764328-241	VALVE, MINI 1/8"NPT X 1/4"ODT	HOKE	3722H24B
44430	764328-240	VALVE, MINI 1/4"NPT X 1/4"ODT	HOKE	3712H4B
67059	764328-270	VALVE, FLOW CONTROL 1/2"NPT	DOLE	GB-2.5

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING
TYPE: GASKET

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
513966	764328-261	GASKET, 16 X 16 CHANNEL (GREEN)	SEALING DEVICES	
58397	764328-313	GASKET, 16 X 16 TUBULAR (GREEN)	SEALING DEVICES	
513967	764328-262	GASKET, 20 X 20 CHANNEL (GREEN)	SEALING DEVICES	
58398	764328-314	GASKET, 20 X 20 TUBULAR (GREEN)	SEALING DEVICES	
60864	764328-260	GASKET, 24 X 36 (RED)	SEALING DEVICES	
518039	764328-267	GASKET, 24 X 36 TUBULAR (GREEN)	SEALING DEVICES	

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING

TYPE: HEAT EXCHANGER

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
66783	764328-232	HEAT EXCHANGER	BASCO	5A01A05014

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING

TYPE: PRESSURE GAUGE

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
37887	764328-238	GAUGE, PRESSURE 1/8" 0 TO 100 PSI LWR MNT JACKET	ASHCROFT	2.5-W-1005-H-01L-
86429	764328-263	GAUGE, PRESSURE 1/8" -30 TO 60 PSI BCK MNT CHAMBER	MERSS	
66747	764328-237	GAUGE, PRESSURE 1/4" 0 TO 100 PSI LWR MNT JACKET	ASHCROFT	2.5-W-1005-H-02L-

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING
TYPE: PUMP

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
45234	764328-236	PUMP, DETERGENT 120/60	GORMAN RUPP IND.	12800-012X-02T-01X
86268	764328-248	PUMP, MAGNETIC DRIVE 1/50HP	MARCH MAN.	MDXT
66782	764328-233	PUMP, WATER 1/2HP 115/230/60	INGERSOLL RAND	HK-3/4 X 5

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING
TYPE: REGULATOR

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PAR
66769	764328-271	PRESSURE REGULATOR	MERSS	

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING

TYPE: SAFETY VALVE

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
62257	56396-708	VALVE, SAFETY 1/2 X 1" 40 PSI	CONBRACO	29-202-09
56913	150828-476	VALVE, SAFETY 3/4 X 1" 40 PSI	KUNKLE/WATTS	571#/561#

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING
TYPE: SOLENOID VALVE

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
14029	764328-250 764328-251 764323-940	VALVE, SOLENOID 1/4" 2-WAY 120VAC 0-50PSI DETERGENT REPAIR KIT COIL, REPLACEMENT	ASCO	JKF8262G36
	764328-521 764328-522 764323-941	VALVE, SOLENOID 1/4" 3-W" 120VAC 0-100PSI AIR/WATER REPAIR KIT COIL, REPLACEMENT	ASCO	JKF8320G184
32664	764328-224 764328-225 764323-941	VALVE, SOLENOID 1/4" 3-WAY 120VAC 0-100PSI STEAM REPAIR KIT COIL, REPLACEMENT	ASCO	JKFX8320G182E
46550 68137	764328-533 764265-001 764323-941	VALVE, SOLENOID 3/8" 2-w 120VAC 1-80PSI STEAM/WATER REPAIR KIT COIL, REPLACEMENT	ASCO	J8222A64
44808	764328-222 764316-147 764323-940	VALVE, SOLENOID 1/2" 2-WAY 120VAC 5-125PSI WATER REPAIR KIT COIL, REPLACEMENT	ASCO	JKF8210G2
61457	764328-532 764328-534 764323-941	VALVE, SOLENOID 3/4" 2-WAY 120VAC 0-50PSI STEAM REPAIR KIT COIL, REPLACEMENT	ASCO	JKF8222G95
	764328-227 764328-228 764323-941	VALVE, SOLENOID 3/4" 2-W" 120VAC 0-150PSI AIR REPAIR KIT COIL, REPLACEMENT	ASCO	JKF8210G95E
53004	764328-536 910006-343 764323-942	VALVE, SOLENOID 3/4" 2-WAY 120VAC 2-125PSI STEAM REPAIR KIT COIL, REPLACEMENT	ASCO	J8222A49

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING

TYPE: SOLENOID VALVE

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART #
53005	764328-223	VALVE, SOLENOID 3/4" 2-WAY 120VAC 5-125PSI WATER	ASCO	JKF8210G9
511470	764324-356	REPAIR KIT		
87293	764323-940	COIL, REPLACEMENT		
67098	83229-002	VALVE, SOLENOID 1" 2-WAY 120VAC 0-50PSI STEAM	ASCO	HV210724-1
	764071-001	REPAIR KIT		
	764071-002	COIL, REPLACEMENT		

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING

TYPE: STEAM TRAP

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
	41067-091 753679-091	TRAP, STEAM 3/8" DISC, REPLACEMENT	SPIRAX SARCO	TD-52
59842	762115-001 762326-001	TRAP, STEAM 1/2" REPAIR KIT	SPIRAX SARCO	TA-125
23614	764328-463 764328-464	TRAP, STEAM 3/4" REPAIR KIT	SPIRAX SARCO	TA-125

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING
TYPE: STRAINER

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
37189	910008-156 910009-009	STRAINER, 1/2" SCREEN, REPLACEMENT	SPIRAX SARCO	1/2-BT
36355	910008-386 910009-017	STRAINER, 3/4" SCREEN, REPLACEMENT	SPIRAX SARCO	3/4-BT
50952	129362472 764326-664	STRAINER, 1" SCREEN, REPLACEMENT	SPIRAX SARCO	1-BT

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING

TYPE: VACUUM BREAKER

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
	77023-001 764326-721	VACCUM BREAKER, 3/4" REPAIR KIT	CONBRACO	38-104
72292	51797-091 764326-722	VACUUM BREAKER, 1" REPAIR KIT	WATTS	M/N M2-288A

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: PLUMBING

TYPE: WATER/STEAM EJECTOR

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART I
66784 59858 86279	764328-246	EJECTOR, WATER 3/4"	PENBERTHY	LM
60699	764328-247	EJECTOR, WATER 1"	PENBERTHY	LM

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: ELECTRICAL
TYPE: CHART RECORDER

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
54882	764328-297	RECORDER CHARTS (BOX OF 50)	GRAPHIC CONTROLS	6282-176
54884	764328-298	RECORDER CHARTS (BOX OF 50)	GRAPHIC CONTROLS	6282-231
511491	764328-300	RECORDER CHARTS (BOX OF 50)	GRAPHIC CONTROLS	6282-76
86516	764328-424	RECORDER CHARTS (BOX OF 50)	LUDLOW	
57161	764328-322	THERMAL ASSEMBLY, CHART RECORDER	MERSS	

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: ELECTRICAL
TYPE: DATA LOGGER

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART
86845	755716-398	PAPER ROLL, DATA-LOGGER (3 ROLL/PKG) 3" WIDE	PAPER SYSTEMS INC	
511515	764324-057	PAPER ROLL, DATA-LOGGER (3 ROLL/PKG) 2 1/4" WIDE	PAPER SYSTEMS INC	
536079	755716-420	PRINTER, MESSAGE CENTER/DATA LOGGER	EPSON	M-183
511516	150828-440	RIBBON CARTRIDGE, MESSAGE CENTER/DATA-LOGGER	EPSON	
87314	764328-501	RIBBON CARTRIDGE, MESSAGE CENTER/DATA-LOGGER	NUKOTE/CURTIS YNG	NK-106N/EC-889

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: ELECTRICAL
TYPE: MICROSWITCH

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART NO.
	764328-235	MICROSWITCH, DOOR	MICROSWITCH	BZE62RN
	764328-234	MICROSWITCH, DOOR	MICROSWITCH	BZE62RN19

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: ELECTRICAL
TYPE: PRESSURE SWITCH

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART NO.
28510 89444	764328-287	PRESSURE SWITCH	MERSS	46046
66264 89298 89620	764328-286	PRESSURE SWITCH, 0-100 PSI	UNITED ELECTRIC	J40-230-9624
518318 530421	764328-291	PRESSURE SWITCH, 0-100 PSI	UNITED ELECTRIC	J40-266-9315

COMPETITIVE EQUIPMENT SERVICE MANUAL

SECTION: ELECTRICAL
TYPE: TEMPERATURE TRANSDUCER

CASTLE PART NO	AMSCO PART NO.	DESCRIPTION	MANUFACTURER	MANUFACTURER PART NO.
86413	764328-295	TEMPERATURE TRANSDUCER, 100 OHM	RDF	RDF 23A(SP)-T01-4-C-9